

New or Rare Malayan Plants. Series V.

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In going over the herbarium at the Botanic Gardens, Singapore, I find a good many plants not recorded in the Materials of the Flora of the Malay Peninsula, some overlooked, others collected since the publication of the earlier numbers. I have therefore put together notes and descriptions of these plants so that they may be on record. A few orchids too received from Sarawak from Mr. Hewitt and others are also described.

Since Sir George King described the *Dipterocarpeae* several new ones were described by Sir D. Brandis, and I have given notes on these, rather fuller than in other cases as these trees are of considerable importance to foresters, on account of the value of their timbers. Curiously among the Dipterocarps omitted from the Materials by Dr. King is the well-known Camphor tree, *Dryobalanops camphora* of which I hope to give a full account when I have got certain further information about it.

DILLENiaceae.

Wormia.

The shrubs and trees of the genus *Wormia* are among the most striking of our local plants, the brilliant colouring of the large yellow, more rarely white flowers, being most conspicuous. The genus is closely allied to the equally showy one *Dillenia*, but is I think very distinct. King in the Materials for a flora of the Malay Peninsula distinguishes the two genera correctly by the absence of an aril in the *Dillenias* and the presence of an aril in the *Wormias*. Martelli in Malasia has mixed the two genera together under the name

Dillenia, and has by no means made this group of plants easier to understand. The real difficulties of separating the two genera lies only in the difficulty of working from badly preserved herbarium specimens. The plants undoubtedly do not, unless very carefully preserved, dry well, but in life there is little difficulty in distinguishing the two genera. The great characteristic lies in the fruit. In *Wormia* after the petals have fallen, the sepals close over the pistil and when the fruit is ripe the carpels expand, becoming of a beautiful rose pink or white. They split along the edge and display the small black seeds clad in a scarlet aril. These pink stars of carpels, two inches or more across in the common species *W. subsessilis* are nearly as attractive as flowers.

In *Dillenia* the sepals once closed over the pistil do not expand any more. They become fleshy and sweet or acid, the carpels enclosed inside do not open, and as they do not ever dehisce, the seeds do not possess a coloured aril, which would be useless in seed dispersal.

Wormia seed is dispersed by birds which attracted by the brightly coloured aril swallow the seeds. The carpels split in the very early morning, and though I have constantly looked for seed at say 8 or 9 o'clock, it is usually already gone, so early do the birds find it. The chief disperser of *W. subsessilis* in Singapore is the common bulbul *Pycnonotus analis* who is very keen on the scarlet arils.

Dillenia on the other hand is dispersed by Mammals, or the rolling away of the fruit or its floating away on the river, on the banks of which some species grow. The fruit is green or yellow pulpy and sweet. As it never opens arils are useless, so it possesses none. This character however is not always easy to make out in dried specimens as is evinced by Sir George King's having transferred *Dillenia meliosmoefolia* correctly referred by Hooker to *Dillenia* to the genus *Wormia*.

The *Wormias* have been separated into sections according to whether the stamens are all equally long or the inner row is longer than the outer one. This is a good distinction but there is a very good separating point in the petiole. In a certain set, all shrubby and inhabiting swamps, the petioles

are strongly winged for the whole length. This broad green wing encloses tightly the bud and protects it from injury from rain, till it is sufficiently strongly developed to separate the wings and appear. There are several species ranging from the Malay Peninsula to Australia, which have this curious arrangement. The others mostly trees have simple unwinged petioles.

Of the wing-stalked species we have two in the Peninsula, viz. *W. suffruticosa*, Griff. and *W. subsessilis*, Miq., to which group may be added, *W. Burbidgei* of Borneo, *W. alata* of Australia, and probably *W. Beccariana*, (Borneo), *W. auriculata*, (New Guinea) and some others.

Of our two species in the Flora of British India Vol. I, p. 35, and also in King's Materials Vol. I, p. 8, *W. suffruticosa* is made synonymous with *W. subsessilis*, Miq. Martelli follows this and adds localities from Borneo (Kuching Sarawak) and suggests that *W. Burbidgei* of Borneo is probably the same thing. The first two species however are quite distinct from each other, always keeping so far as I have seen their characteristics true and not mixing.

W. Burbidgei, Hooker is a rather puzzling plant. It is based on a plant brought by Burbidge from Borneo and figured in the Botanical Magazine t. 6531. It has smaller and paler flowers than most species. No one seems to have met with it again, and the figure in the Botanical Magazine suggests that it is a deteriorated plant of one of this group, affected by its cultivation in the houses at Kew Gardens.

Round Kuching however lie big swamps in which among other splendid flowers, grows a plant like a glorified *W. suffruticosa*. Like *W. subsessilis* it forms tall and dense thickets layering itself by its branches in the water, but it is taller and is especially conspicuous from the great size of its flowers considerably bigger than those of *W. suffruticosa*, its very large leaves more strongly dentate, and its white not pink fruit. This is probably the plant referred to by Martelli as *W. suffruticosa*. It might be classed as a variety of *W. suffruticosa* var. *borneensis*.

As there has been so much confusion in our two Peninsular species, I give complete description of them.

Wormia subsessilis, Miq. Fl. Ind. Bat. Suppl. I. 618. Ann. Mus. Lugd. Bat. I. 315, t. 9.

A very large shrub forming large thickets in damp open spots. Stem as much as 6 inches thick branching at the base. Branches decurved and rooting at the nodes, where they reach the ground. Shoots and leaves quite glabrous except for a few hairs along the midrib and bases of the nerves behind. Leaves ovate or oblong ovate obtuse, except for the midrib prolonged into a short mucro, margin distantly and parallel, base broad, passing into the broadly winged petiole, which encloses entirely the bud, blade dark green above nerves lighter coriaceous 8-12 inches long 6-7 inches wide, petiole $1\frac{1}{2}$ inch long. Raceme decurved, of 5-6 flowers. Bracts lanceolate claw-like pinkish $\frac{1}{2}$ inch long. Flowers 5 inches across. Sepals ovate obtuse edges ciliate at the tip, 2 outer ones dull red not visibly nerved, nearly $\frac{3}{4}$ inch long, 3 inner a little smaller green with traces of red coloring. Petals 5 undulate hardly crenate bright yellow 2 inches long $1\frac{1}{2}$ inch wide. Stamens white $\frac{3}{4}$ inch long, the outer row of staminodes shorter yellow. Styles 7, greenish a little longer than the stamens. Carpels 7, rose pink, sutures and centre white, 1 inch long when fully expanded ovate tipped by the withered style. Seed subpyriform $\frac{1}{5}$ inch long black with a red aril.

Common in the swampy open country of the South of the Peninsula.

Singapore: Tanglin abundant; Pulau Tekong (Ridley 3966); Pulau Ubin. Johor: Pinerong Estate (Cantley); Kwala Sedili Besar (Feilding). Distrib. Banca.

var. *borneensis*, n. var. A very tall plant forming dense thickets and layering itself by its branches. Leaves very large 18 inches long and 12 inches across, margins strongly dentate, with thorn-like processes at the tips of the teeth,

young parts of the plant branches, buds, petiole and midrib and veins densely silky hairy, adult leaves glabrous. Peduncles over a foot long silky hairy, flowers about 6 to 12. Sepals in flower hairy on the edge. Flowers 4 inches across or more petals bright yellow. Fruit when expanded white.

Borneo, Sarawak: in swamps at Kuching abundant.
Wormia suffruticosa, Griff. Notul. IV: 706. Ic. IV. t. 6496.

A more stunted plant straggling up to ten feet tall but commonly 4 to 6 feet, and not forming the dense large thickets of *W. subsessilis*. The leaves resemble those of the latter but the bases are broader and run less into the winged petiole, and the margin is distinctly dentate. When young they are covered with close set white woolly hairs on the midrib and nerves on the back, and this hair persists on the petiole. The hair however disappears to a large extent on the adult leaves. It covers too the young parts of the stem. The flower spikes are stouter than in *W. subsessilis* and the peduncles and branches are also woolly. The flowers much resemble those of the latter species but the sepals often are slightly hairy on the edge, and the petals more obovate and larger, yellow. The stamens white.

The plant is called "Simpoh Gajah." It is rarer in the South of the Peninsula where *W. subsessilis* takes its place. In Singapore it occurs in jungle swamp at Stagmount along the railway, and Jurong. In Johore, I have seen it at Sedenah. In Malacca abundant at Bukit Bruang (Holmberg 712). In Negri Sembilan Cantley's collector sent it from Seremban, and Goodenough collected it (No. 10470) at Rawang.

I have no evidence that it occurs outside the Peninsula.

W. tomentella, Mart. Malesia, III. 159. A tree, about 40 feet tall and 2 to 3 feet through with light brown bark. Branches pubescent. Leaves elliptic obtuse at both ends, entire or shortly cuspidate 6-10 inches long, 5 inches wide, above glabrous, nerves 13 pairs, transverse nerves

conspicuous beneath, hairy especially on the nerves, petiole 1-2 inches long pubescent deeply channelled not winged. Racemes from the upper axils about 6 inches long pubescent, pedicels 1 inch long pubescent. Sepals oblong obtuse dull red glabrous 1 inch long. Petals spatulate broad, apex rounded $1\frac{1}{2}$ inch long $\frac{3}{4}$ inch wide, light yellow. Stamens yellow, in two unequal series inner ones longer reddish, pores 2. Pistils 7, glabrous red, styles long, subulate. Capsule white.

Singapore: Garden Jungle, Selitar (Ridl. 6382), Bukit Timah (Ridley 6809); Johore: Tebrau Road; Borneo: Kuching (Haviland).

This is no doubt identical with the Borneo plant on which Martelli based his species. It is by no means a floriferous tree like *W. oblonga*, usually only producing a few flowers at irregular intervals through the year. It is omitted from the Materials.

W. parviflora, n. sp.

A small tree, branches pubescent. Leaves broadly lanceolate or ovate lanceolate membranous, base somewhat narrowed, apex acute, margin nearly entire or with a few obscure teeth glabrescent above except the midrib, beneath covered with rough hairs especially on the midrib and nerves, nerves about 18 pairs, reticulations prominent, 6-9 inches long, 2-4 inches wide, drying red, petiole slender not winged $\frac{1}{2}$ -1 inch yellow pubescent. Flowers few small on short $\frac{1}{2}$ inch peduncles, pedicels slender 1 inch long. Bracts linear all densely yellow hairy. Sepals obovate rounded densely yellow hairy $\frac{1}{2}$ inch long. Petals obovate thin little longer, margins crisped. Stamens unequal inner series longer than the outer one glabrous.

Malacca: Merlimau (Derry 1077), Ayer Panas (Curtis 3489).

I have not met with this plant myself and have no note of its colour. It is known as "Simpoh Bukit."

Wormia albiflos, n. sp.

Large shrub, very pubescent. Leaves elliptic oblong narrowed towards the base, which is rounded, apex cus-

pidate acute, margins serrate, nerves 24 pairs alternate prominent beneath each ending in a marginal tooth, midrib thick, reticulation nerves prominent, pubescent on both surfaces, softly densely tomentose beneath, above more glabrous, with a thick crest of hair along the midrib, 7 to 10 inches long 3 to 4 wide, petiole 1-1½ inch long widely sheathing nearly to apex as in *W. suffruticosa*, but densely softly pubescent. Inflorescence from the upper axils paniced, peduncle 3 inches long with two spreading branches of the same length, all softly pubescent. Bracts ovate acute ¼ inch long pubescent. Buds globose very shortly pedicelled. Calyx lobes 5 obovate obtuse rounded pubescent on the back ½ inch long $\frac{2}{5}$ inch wide. Petals thin obovate rounded, glabrous white ½ inch long. Stamens numerous glabrous all about equal. Pistils silky hairy. Fruit unknown.

Johore: in wet woods at Tebing Tinggi (Ridley 11053).

A very pretty small-flowered white species. The fruit unknown.

DILLENIA.

- D. Scortechinii*, King Mss. *Wormia Scortechinii*, King Materials l. c. p. 366.

There is I think no doubt but that this plant is a *Dillenia* as King at first suggested and not a *Wormia*. The fruit resembles that of *D. meliosmaefolia*, but is green and not yellow. The plant is by no means rare in the South of the Peninsula and is quite conspicuous in the woods from its possessing large stilt-roots in which the whole tree appears to be supported. So striking is this that visitors on seeing the tree in the Garden Jungle have enquired if it was a mangrove tree. The whole tree is about 60 feet tall with a smooth reddish bark.

It occurs in the Garden Jungle of Singapore.

- Dillenia meliosmaefolia*, Hook. fil. *Wormia meliosmaefolia*, King.

I have carefully examined this plant which is in cultivation in the Botanic Gardens Singapore and cannot find any aril to the seeds, nor does the fruit ever dehisce as those of a *Wormia* do. It is obvious that Sir Joseph Hooker was right in referring this tree to the genus *Dillenia*. It is a fairly tall but not stout tree occurring in the hill forests. In cultivation in the Botanic Gardens in open ground it became more bushy and is flowering at a height of about 12 feet. The leaves are soft and bright green glabrous above and pubescent beneath. The flowers appeared in September. The sepals are in two whorls three outer ones and two inner ones somewhat gibbous and more silky. The petals 5, are narrow oblong obtuse narrowed at the base and lemon yellow $1\frac{1}{2}$ inch long and half an inch wide. The outer two or three rows of the stamens are shorter than the inner rows and yellow with an apiculate connective, the innermost row is white longer and appressed to the carpels. These are ten in number white linear and recurved. Each cell contains 6 non-arillate seeds. The sepals in fruit, are swollen yellow pulpy and acid, the carpels sweet and juicy and the whole fruit is eaten by the Sakais and Jakuns. Indeed it is quite refreshing on a hot thirsty day, though the sepals are decidedly acid. The whole fruit is about an inch through. The tree is known as "Simpoh Bukit" "Simpoh hutan" and "Simpoh jantan."

It occurs in thick forests in Malacca: Ayer Keroh, Ayer Panas (Goodenough 1983), Selandon (Cantley); Negri Sembilan: on Gunong Angsi (Ridley), Selangor at Kwala Lumpur (Curtis 234), Bukit Hitam (Kelsall); The Dindings at Lumut, and Bukit Tungul (Ridley); Perak at Chenderiang (King's Coll. 5787), Tapah (Ridley).

TETRACERA.

T. sylvestris, n. sp.

A tall woody climber in forests ascending to about 60 feet, with grey bark. Leaves at the ends

of the branches oblong cuspidate with a rounded base, thinly coriaceous not scabrid, nerves eight pairs, dark green shining above, margin obscurely crenate at the tip, 3 to 6 inches long, $1\frac{1}{2}$ to 3 inches wide, petiole $\frac{1}{4}$ inch long, hairy. Panicles short and few branched, bearing a few flowers, pubescent. Bracts very small lanceolate. Pedicels $\frac{1}{4}$ inch long pubescent. Buds globose. Sepals 4 obovate rounded, light green $\frac{1}{4}$ inch long, margins pubescent, and inner face thickly covered with appressed silky hairs. Petals small white spatulate $\frac{2}{5}$ inch long, $\frac{1}{5}$ inch wide. Stamens shorter, very numerous white, filaments flexuous. Carpels 4 pale green, styles rather stout tapering, stigma capitate. Follicles polished $\frac{1}{2}$ inch long longer in proportion to their breadth than in *T. assa*.

Singapore: Garden Jungle (Ridley 6179), Changi; Malacca: Merlimau; Selangor: near the Batu Caves (Ridley 8249); Perak: Tapa (Wray 1266).

This plant has been it appears confused with the common *Tetracera assa* D. C., from which however it is very distinct. *T. assa* is a sarmentose shrub, often forming bushes in open country, or climbing in hedges but at no great height, the leaves are much smaller than in *sylvestris*; the flowers larger; the sepals glabrous within are often tinted with red at the top; the stamens more numerous, longer and conspicuously tipped with rose pink. Carpels usually 2.

T. sylvestris is a high climber in forests, with larger leaves, of a lighter green and not denticulate as in *T. assa*. The flowers are smaller and the sepals lined inside with silky hairs, the stamens shorter fewer and white slightly yellowish at the tip. The carpels are 4 in number. The young leaves are of a beautiful light reddish pink.

There are a number of species of *Tetracera* more or less described by Miquel and Blume from the Malay islands, Sumatra, Java, etc., but so incompletely in many cases that it is not possible to identify what is meant, and this may be one of them.

Tetracera fagifolia, Bl. Bijdr. 4.

This species has not been recorded in the Materials, as a native of our region. It occurs in the Garden Jungle and at Selitar in Singapore (No. 6381 and 6381a of my collections) and is too a native of Java. It is easily recognized by its lanceolate leathery leaves, stiff and polished about 3-5 inches long and 2 inches wide quite glabrous with 8 pairs of prominent ribs. The panicle of flowers is lax, about 6 inches long silky hairy. The sepals silky hairy on the edge and in the middle on the inner side. The flowers resemble those of *T. curyandra*, Vahl.

It does not seem to be very common or more probably seldom flowers as is so often the case with the *Tetraceras*.

MAGNOLIACEAE.

Talauma elegans, Miq. Ann. Mus. Lugd. Bat. IV. 70. *Aromadendron elegans*, Bl. Bijdr. 8.

This fine tree is not recorded for the Malay Peninsula in the Materials. It is a straight tall tree 60 to 80 feet tall, with coriaceous finely reticulated dark green leaves 3 or 4 inches long and 1 to 1½ inches wide elliptic and shortly acuminate, the petiole $\frac{1}{5}$ to $\frac{1}{4}$ inch long. The flowers of the usual magnolia type are a little over two inches long, the petals narrow linear acuminate, white and fragrant. The sepals lanceolate and glabrous. The stamens very slender and hardly half as long as the petals. The fruit is about 3 inches long obovoid narrowed to the base and smooth green with light pink seeds.

It grows in the Garden Jungle near the Fernery (No. 4429, and 5592 of my collection) and I have it also from Machap on the Selandor road, Malacca collected by Derry (No. 511), Curtis obtained it too on Government Hill, Penang (No. 3012). Derry gives the name "Kayu Arang" possibly by some error as this is usually applied to Ebony, and Curtis "Chempaka hutan."

ANONACEAE.

Polyalthia Curtisii, n. sp.

Tree 30 to 40 feet tall, branches dark-colored. Leaves elliptic lanceolate subacuminate blunt, base rounded thinly coriaceous glabrous, nerves hardly elevated 7 pairs, reticulations fine conspicuous 3-4 inches long, $1\frac{1}{2}$ inch wide. petiole $\frac{1}{2}$ inch long. Young leaves and shoots red pubescent. Cyme compound from the branches about 1 inch long golden pubescent with few branches. Bracts small ovate semiamplexicaul, golden hairy outside. Pedicel half an inch long. Sepals ovate hairy $\frac{1}{10}$ inch long. Outer petals linear oblong $1\frac{1}{2}$ inch long, $\frac{1}{4}$ inch wide, hairy outside, inner ones much shorter spatulate obovate obtuse. Stamens numerous, small cells parallel, connective large rounded curved over.

Penang: Telok Bahang (Curtis 3644).

In some respects this resembles *P. sclerophylla*, King, but the flowers are borne on the branches in short panicles, not on clusters in the stem.

Polyalthia angustissima, n. sp.

Slender tree about 20 feet tall with dark bark, and fine twigs. Leaves lanceolate acuminate glabrous shining little over 3 inches long 1 inch across, nerves not very conspicuous beneath 6 pairs, (young leaves rose pink), petiole $\frac{1}{8}$ inch long black pubescent. Flowers shortly pedicelled, pendulous beneath the branches, not on the stem, pedicel $\frac{1}{10}$ inch long, golden pubescent. Sepals 3 very small lanceolate acuminate $\frac{1}{11}$ inch long, golden hairy. Petals 6-7, bases gibbous above linear acuminate sparingly hairy with long appressed hairs, cherry pink at base gradually getting lighter to yellowish at the tip, $2\frac{1}{2}$ inch long, hardly $\frac{1}{11}$ inch wide, sides involute, not keeled. Stamens quadrate, connective dilated incurved, in 3 rows white. Pistils 7-12 hairy, styles conic. Fruit carpels few, 2 or 3 globose as large as a red currant, minutely apiculate quite glabrous $\frac{3}{8}$ inch long, bright red pedicels $\frac{1}{10}$ inch long, pericarp pulpy. Seed 1, rounded oblong smooth light brown.

Singapore: sandy woods Changi (Ridley 5917), Bukit Timah (8050), Garden Jungle (4813); Johore: Kwala Sembrong (Kelsall 4047). "Sisik Managon."

This tree is quite distinct from the plant—I believe was intended for *Unona stenopetala* by Hooker, the leaves of that being very much larger. It has a typical *Polyalthia* fruit. Specimens in flower have been referred to a variety of *Unona stenopetala* at Kew.

It is always more or less in flower in the gardens but seldom fruits.

Polyalthia pumila, n. sp.

Dwarf shrub about a foot tall little or not branched. Stem black densely covered with rusty hairs. Leaves elliptic or oblanceolate coriaceous, base broad nearly sessile, above dark glabrous, beneath paler, minutely red dotted, and sprinkled with hairs, nerves above inconspicuous-beneath prominent about 12 pairs, alternate, meeting in an undulate intramarginal nerve some way from the edge 8-10 inches long, 3 inches wide petiole swollen $\frac{1}{4}$ inch long densely red hairy. Flowers solitary axillary nearly sessile bright orange color. Calyx lobes 3 triangular lanceate obtuse, silky hairy outside less hairy within $\frac{1}{10}$ inch long. Petals 3 outer ones, linear lanceate subacute $1\frac{1}{4}$ inch long by $\frac{1}{10}$ inch wide dilated at the base but not excavate silky hairy especially at the base glabrescent upwards. Inner petals 3, $1\frac{1}{2}$ inch long, narrower linear glabrescent. Stamens minute cuneate, filament very short, connective rounded recurved. Back of anther keeled. Carpels few stigmas short densely silky.

Dindings: Telok Sera Woods (March 7996); Johore: Gunong Janing (Kelsall.)

The most dwarf *Anonacea* I have ever seen, with a short stem large coriaceous leaves like those of *Agrostis-lachys* and rather large handsome orange flowers. Kelsall gives the Johore name of "Kananga Merah." I have not seen fruit of this but I take it to be a *Polyalthia*. It is remarkable not only for its small size but for the

inner petals being considerably longer than the outer ones.

Mitrephora crassipetala, n. sp.

A tree, branchlets pale. Leaves oblong or oblong lanceolate, acuminate acute glabrous drying grey, nerves elevated beneath 9 pairs looping within the margin, base rounded, 6 to 8 inches long $2\frac{1}{2}$ to $2\frac{3}{4}$ inches wide, petiole $\frac{1}{4}$ inch long or a little more. Flowers on short half inch racemes, in clusters on the stem. Bracts $\frac{1}{2}$ inch long ovate persistent. Flowers white hardly opening, sessile on articulations on the raceme. Sepals 3 ovate obtuse, margins ciliate $\frac{1}{10}$ inch long. Outer petals ovate, with a broad base, white $\frac{3}{10}$ inch long apex very thick coriaceous. Inner ones spatulate, limb triangular thick fleshy connivent into a cone. Stamens numerous oblong with a triangular ovate connective crest. Pistils abortive. Female plant and fruit not seen.

Pahang: Tahan River (coll. plant collector Mat in Becher's expedition).

A very distinct plant in its curious little racemes borne on the stem, and its peculiarly thick fleshy flowers.

Milusa amplexicaulis, n. sp.

Branches brown tomentose. Leaves nearly sessile elliptic ovate acuminate base broad unequally bilobed subamplexicaul 7 inches long $3\frac{1}{2}$ inches wide, 12 pairs of nerves elevated beneath above glabrous, beneath sprinkled with hairs, midribs and nerves hairy, young leaves golden hairy beneath, and on upper midrib. Petiole $\frac{1}{10}$ inch. Flowers axillary in pairs on threes on short hairy peduncles, $\frac{1}{4}$ inch long pedicels about as long. Bracts smaller ovate with hairy margins. Sepals 3 ovate subacute with hairy edges. Outer petals similar, slightly longer. Inner petals ovate triangular fleshy broader than long, glabrous, with hairy edges $\frac{1}{10}$ inch long. Stamens about 3 whorls, bases hairy cells approximate, connective broad ovate, glabrous. Pistils several, style very short.

Lankawi: Kwah (Curtis 3205).

MENISPERMACEAE.

Tinomiscium petiolare, Miers.

This plant is common about Singapore in woods, and has been described by Miers, (Contrib. iii. 45. t. 94) and by Sir George King in the Materials for a flora of the Malay Peninsula I. p. 379. The female flowers however have never been described, and I am quite unable to understand what is meant by the descriptions of the male flowers in either account, as they do not coincide at all with the flowers as I see them. The descriptions however were made from dried and perhaps indifferent specimens. I therefore describe the plant afresh from life adding a description of the female flowers from a dried specimen. The plant is a woody climber usually about three inches thick with a milky latex. The leaves are coriaceous dark green ovate oblong obtuse or usually shortly acuminate. The male flowers are in simple racemes tufted from the stem far below the leaves. The flowers are pale green and $\frac{3}{10}$ inch across, the pedicel and a small ovate bract at the base are red hairy. The sepals are 3 or 4, very small ovate acute covered with short red hairs. (I suppose these are the "3 bracts" mentioned in the other descriptions). The petals are in two series. The six outer ones are linear oblong obtuse, the edges minutely white hairy. They are rather unequal in size and the four sepals are opposite to the four largest. These petals are spreading. The inner series are shorter oblong with incurved edges white and glabrous, 6 in number and connivent. The stamens 6, have thick fleshy filaments swollen at the base then narrowed, dilated again and ending in a thick incurved rather beak-like process. The anther cells are widely separated on the outer edges of the thickened upper portion of the filament. I cannot see any trace of a pistil at all.

The female flowers are borne on a long pendulous panicle 18 inches or more long, bearing long distant racemes 8 inches or more long, pubescent, with flowers

remote, singly or in twos or threes, on hairy pedicels $\frac{1}{10}$ inch long, the bracts small ovate and hairy. Sepals 2 lanceolate hairy very small. Outer petals linear oblong obtuse pubescent. Inner petals 6 shorter oblong incurved glabrous. Stamens 6 as in male. Drupe green with white spots elliptic flat.

Nephroica elegans, n. sp.

A slender twining plant growing among grasses, stem hairy, laticiferous. Leaves deltoid to lanceolate acute or elliptic lanceolate, base rounded, trinerved reticulations distinct sprinkled with hairs, midrib hairy on both sides, 2 inches or less long $\frac{1}{4}$ - $\frac{1}{2}$ wide, petiole $\frac{1}{2}$ inch long hairy. Racemes axillary $\frac{1}{10}$ inch long hairy. Sepals very small ovate obtuse 5. Petals outer rotundate ovate acute 3. Inner petals ligulate oblong with two long linear points, 6. Stamens as long 6, with fairly stout filaments and globose anther cells transversely dehiscing.

Tringanu: Cherating river in grass on the shore, Aug. 25, 1889 (Ridley); Dindings: Lumut (Ridley).

The Dindings plant has larger and more elliptic leaves than those of the Cherating plant, some of the latter being very narrowed. The genus is referred to *Cocculus* by the authors of the Flora of British India, but it seems to me a very distinct one, as Miers has arranged it.

Stephania rotunda, Lour.

Slender climber stem glabrous. Leaves thin ovate petiole glabrous above beneath scurfy on the nerves, nerves 6 elevated above (when dry) $2\frac{3}{4}$ long, $2\frac{1}{4}$ inch wide reticulations conspicuous, petiole slender scurfy $1\frac{1}{2}$ inch long. Panicles not axillary slender 1-4 inches long, with few slender branches, and umbellate small flowers. Pedicels short. Flower $\frac{1}{10}$ inch across. Sepals linear oblong narrowed at base obtuse 3. Petals ovate rounded larger 2. Inner petals 3 lanceolate oblique. Stamens connate in a round disc, stalked, anthers below the disc.

Lankawi: Kwah (Curtis), also occurs at Bangtaphan, Siam (Dr. Keith).

This has not previously been recorded for the Peninsula, but I think I am correct in referring the Lankawi plant to Loureiro's species.

POLYGALACEAE.

Polygala cardiocarpa, Kurz. Journ. Roy. As. Soc. Beng. 1872, p. 291.

Slender herb branched above glabrous 6 or more inches tall. Leaves alternate thin ovate obtuse 1-2 inches long 1 inch wide narrowed into the petiole which is $\frac{1}{2}$ inch long. Spikes slender 2 inches long, base nude, flowers numerous very small yellow $\frac{1}{10}$ inch long. Sepals 4 ovate rounded, outer ones larger. Petals oblong ovate. Keel not crested, broad ovate with a prolonged tip. Stamens 8. Capsule, sepals deciduous heart-shaped retuse, wings strongly ribbed, seed elliptic black pustulate with a small black caruncle.

Limestone rocks. Selangor: Gua Batu (Ridley 8243); Lankawi: small islands (Curtis 3686), Pulau Sirih (Curtis 2581); Siam: Kasum (Curtis 3256).

I have little doubt that this little herb is the plant described by Kurz. under the above name, though his description is rather short. The original plant came from Tenasserim, and this is another instance of this Tenasserim limestone flora descending as far south as the Kwala Lumpur Caves. On the top of the limestone rocks of this spot I met with this little milkwort.

HYPERICINEAE.

Hypericum japonicum, Thunb. Fl. Jap. 295 t. 31. Hook. fil. Fl. Brit. Ind. I. 256.

A small prostrate or ascending herb from 5 to 10 inches tall, with slender branched stems. Leaves ovate sessile opposite glabrous about $\frac{1}{4}$ inch long blunt.

Flowers solitary axillary on slender peduncles $\frac{1}{4}$ inch long, yellow. Sepals oblong lanceolate. Petals as long as the sepals persistent. Stamens not numerous free nearly to the base. Capsule elliptic oblong or ovoid $\frac{1}{10}$ inch long dehiscent into three valves.

This little weed has been omitted from the Materials for a Flora of the Malay Peninsula by Sir George King, though it is by no means rare. It occurs in pepper fields and rice fields in Singapore and Penang, and probably elsewhere. It has obviously been introduced but has thoroughly established itself.

Singapore: Bukit Timah Road (Ridley 11273) also Chua Chu Kang, and Jurong; Penang: Penara Bukit (Ridley) and Pulau Betong (Curtis 1946).

Its distribution is from India to Japan, China, Java, Australia and New Zealand.

GUTTIFERAE.

Calophyllum ferrugineum, n. sp.

A large tree. Buds, young leaves on the midrib and edges, covered with a close ferruginous tomentum, Branches 4 angled. Leaves elliptic oblong coriaceous apex rounded truncate retuse, above shining, beneath dull, nerves very fine parallel, glabrous except the midrib beneath red tomentose, 3 inches long $1\frac{1}{2}$ inch wide, petiole $\frac{1}{2}$ inch long. Racemes axillary $2\frac{1}{2}$ inch long, peduncle 1 inch thickly red tomentose. Flowers about 8 in a raceme distant on slender pedicels $\frac{1}{2}$ inch or less long quite glabrous. Flowers $\frac{1}{4}$ inch across. Sepals 4, inner suborbicular, outer more ovate smaller. Petals 0. Stamens, anthers oblong. Pistil glabrous. Fruit obovoid an inch long narrowed to the top glabrous.

Singapore: Garden Jungle near Rogie (Ridley 10842, 4799).

This is allied to *C. molle* but differs in the completely glabrous flowers.

Calophyllum foetidum, n. sp.

Tall tree about 80 feet tall, and 8 inches through, bark flaky. Leaves elliptic narrowed to the petiole very shortly narrowed to the tip, coriaceous fine nerved, $1\frac{1}{2}$ - $3\frac{1}{2}$ inches long, $1-1\frac{1}{4}$ inch wide, petiole $\frac{1}{2}$ inch long. Flowers small $\frac{1}{4}$ inch across foetid, in lax racemes axillary 3 inches long of about 8 flowers, pedicels slender $\frac{1}{2}$ inch long. Bracts very small ovate caducous. Sepals 4 ovate lanceolate reflexed glabrous. Petals 4 obovate subspathulate apex rounded base narrowed $\frac{1}{10}$ inch long. Stamens very numerous shorter. Pistil conic glabrous style longer than the stamens, stigma discoid. Fruit small elliptic about $\frac{1}{4}$ inch long.

Singapore: Garden Jungle (Ridley 13305, 14119, 11958 and 6935); Malacca: Bukit Bruang (Derry).

This tree is remarkable for the small size of its flowers, which possess a very unpleasant odour. It is one of the comparatively few species in this region which possess petals and have lax racemes of distant flowers.

GARCINIA.

The *Garcinias* are often difficult to make out from dried specimens as they do not preserve well and further being unisexual one is apt only to get hold of plants of one sex. Three species of the small fruited ones commonly known as Kandis by the Malays, have thus been confused in the Materials. Indeed under *G. nigrolineata*, Plouch. King suggests that his description may cover two species. I have been able to study these plants from living specimens in the forests, and find that what he classes as *G. nigrolineata* covers three species, viz., the true *G. nigrolineata* of Pierre, a species apparently undescribed for which I propose the name *Garcinia globulosa*, and the *Garcinia parvifolia*, Miquel.

Garcinia nigrolineata, Pierre Fl. Cochinchinensis VI. p. xxix, t. 81, fig. 1 F.

Tree 30 to 40 feet tall, branchlets above subangled. Leaves coriaceous lanceolate acuminate, glabrous, narrow-

ed to the base, 3 to 6 inches long 1-2 inches wide, nerves fine ascending numerous petiole $\frac{1}{2}$ inch long. Male flowers in umbels of 4 to 10, pedicels $\frac{1}{10}$ inch long, flowers $\frac{1}{10}$ inch long, on the tips of branches. Sepals orbicular fleshy concave 4. Petals longer lanceolate oblong subobtuse. Stamens about 20, forming a compact mass. Filaments very short, anther cells 4 broad with a thick connective, no pistil. Female flowers in umbels of four on the termination of branches, larger than the males, pedicels short thick $\frac{1}{10}$ inch long. Sepals orbicular concave rounded. Petals oblong lanceolate acute, longer. Ovary ovoid, stigma large papillose convex. Staminodes about 8, resembling the stamens. Fruit fleshy an inch through oblong, globose, crowned with the thick apiculus bearing the pustular stigma.

Singapore: Changi (Ridley 5005, 3611, 1967, 4644), Sungei Morai (4643), Tanjong Sukopek (3992); Johor: Gunong Pulai (Ridley); Pahang: near Pekan (Ridley); Malacca: Nyalas (Derry), Bukit Bruang (Ridley 4645); Penang Waterfall: Stone Quarry (Curtis 2412); Dindings: Pangkor (Ridley 7969); Lankawi: Kwah (Curtis); Carimon Islands (Ridley 7111).

“Kandis Jantan.” This is a very distinct plant from the common Kandis, and is doubtless the plant referred to by King as the specimens with lanceolate acuminate leaves (p. 165). The typical leaves of this plant are narrow stiff and finely veined but it has also in some specimens which I cannot separate distinctly ovate leaves much broader. I find however narrow leaves as well on all or nearly all the broad leaved specimens. The Lankawi plant has the foliage of the narrow leaved form, but as the flowers, male, are very much larger it may be a distinct variety. This plant is undoubtedly Pierre's *G. nigrolineata* and I think also Anderson's plant in the Fl. Brit. Ind. though I have not seen the type. King's *nigrolineata* may be this partly but nearly all the specimens distributed under this name by him belong to a very distinct plant.

Garcinia globulosa, n. sp.

A fairly tall straight tree with rough bark scaling off. Leaves elliptic acuminate thinly coriaceous many-nerved, the nerves fairly conspicuous, 2 to 3 inches long, and $1\frac{1}{2}$ inch wide, the petiole $\frac{1}{4}$ inch long. The male flowers in terminal or axillary umbels bright yellow 6 or 8 in an umbel, pedicels $\frac{1}{5}$ inch long. Sepals 4 rounded gibbous small yellow. Petals 4 oblong rounded at the tip, $\frac{1}{5}$ inch long lemon-yellow. Stamens about 20 in a cluster on a short cylindric column, anthers brown square flat at the top. Female flowers in terminal and axillary umbels of 4 or 5, larger pedicel thicker and angled. Sepals rounded orbicular $\frac{1}{10}$ inch long. Pistil ovoid. Stigma not stalked large rounded pustular. Fruit globose orange half an inch through, not umbonate. Stigma sunk in a depression and almost concealed. "Kandis" common in forests.

Singapore: Common Garden Jungle (Ridley 9195), Bukit Timah (9142, 4450), Selitar (266, 1968, 1966, 1825), Alma and Changi (Hullett 41); Malacca: Bukit Bruang (Goodenough 1270), Selandor (Cantley); Selangor: near Ulu Selangor (King's Coll. 8539); Perak: Batu Togoh (Wray 2531 and 3183).

This is the common little round fruited Kandis of the forests which is quite pleasant to eat. It often fruits heavily and one can get quite a basket of it from one tree. I once attempted to cook it to see if it would do for a pie, but found it not a success. It seemed to develop an astringency and toughness in the skin on cooking that spoilt it.

G. parvifolia, Miq. Fl. Ind. Bat. Suppl. 495.

A small tree much branched with rather rough bark, but not scaly as in the preceding. Leaves dark green thinly coriaceous dull elliptic acuminate narrowed at the base, apex cuspidate $4\frac{1}{2}$ inches long $1\frac{1}{2}$ inch wide, with a cusp half an inch long, the petiole half an inch. Male flowers in loose heads of 2 or 3 on pedicels $\frac{1}{4}$ inch long. Sepals 4 short ovate yellow. Petals 4 oblong tip round-

ed, widely spreading $\frac{1}{4}$ inch long cream colour. Stamens about 30 in a sessile head, filaments oblong short spreading. Anthers fawn coloured truncate quadrate. Female flowers in axillary and terminal cymes of 3 to 5 sessile, pedicels thick green $\frac{1\frac{1}{2}}{10}$ inch long. Sepals 4, 2 outer ovate rounded green $\frac{1}{20}$ inch long inner smaller yellow. Petals yellow oblong rounded $\frac{1}{10}$ inch long. Stamens (abortive) 4, narrow linear clubbed at the tip. Pistil subglobose. Stigma orbicular, margins lacerate with short papillae, top covered with erect papillae pale white obscurely 6 lobed. Fruit elliptic in outline pulpy orange colored slightly inaequilateral, umbonate at the top and blunt, the stigma very small sunk in a depression and almost quite concealed, an inch and a half long and nearly an inch through. Cells 6 with 3 to 5 seeds developed.

Singapore: Garden Jungle (Ridley 3586a, 14122), Bukit Timah (4450 and 10744).

It flowers and fruits most of the year. The larger broader leaves, the larger male flowers and the shape of the fruit distinguish the plant readily.

KAYEA.

Kayea ferruginea, Pierre Fl. Coch. t. 99.

This is omitted from the Materials. It is a fairly large straggling tree found like most of the genus overhanging streams or rivers in forests. The leaves are leathery and stiff lanceolate caudate acuminate 3 to 6 or 9 inches long, 1-2 inches wide quite glabrous, petiole $\frac{1}{4}$ - $\frac{1}{2}$ inch long. The fruit is large an inch through the sepals, ovate oblong rather longer leathery, scurfy outside polished within. I have not seen flowers of it, but have it in fruit from Johore, collected by Kelsall at Sungei Sembrong, and by myself on the river bank at Kota Tinggi (4187); Pahang at Ayer Hitam, near Pekan, and from the Dindings where R. Derry collected it. This latter has unusually long narrow oblong leaves, but I take it to be the same. It varies a good deal in the form of the leaf. Kelsall gives the name "Buah Sembawang" for it.

Kayea rosea, n. sp.

A medium sized tree. Leaves in distant pairs elliptic cuspidate apex acute base obtuse or shortly acuminate, coriaceous glabrous smooth above nerves 20-25 pairs raised beneath 8 inches long, 3 inches wide, cusp $\frac{1}{2}$ inch long, petiole thick $\frac{1}{4}$ - $\frac{1}{2}$ inch long. Flowers rosy white paniced, panicles 1 or 2 terminal, 3 inches long. branches short, rachis thick corky rugose light brown. Pedicels $\frac{1}{5}$ inch long outer sepals orbicular thick $\frac{1}{4}$ inch long petals ovate ribbed, a little longer. Stamens numerous short, filaments short linear, anther cells curved. Fruit not seen.

Johore: By streams Gunong Panti (Dec. 1892) Ridley.

The only paniculate species yet recorded from the Peninsula.

K. rivulorum, n. sp.

Small straggling tree branches with long internodes. Leaves opposite in pairs with 4 small ovate stipule like leaves above them, in a cluster, main leaves lanceolate long cuspidate base hardly narrowed 5 to 6 inches long $1\frac{1}{2}$ to 2 inches across, nerves about 14 pairs depressed above, elevated beneath leaf altogether glabrous and thinly coriaceous, petiole $\frac{1}{10}$ to $\frac{1}{5}$ inch long; small leaves ovate acuminate $\frac{1}{4}$ inch long cordate sessile. Flowers 3 or solitary terminal almost sessile, surrounded at the base with small ovate acuminate bract-like leaves $\frac{1}{2}$ inch long. Sepals ovate coriaceous $\frac{1}{2}$ inch long. Petals narrow linear oblong longer. Stamens very numerous long slender, ovary conic acuminate, style shorter stigma apparently entire. Fruit conic acuminate $1\frac{1}{2}$ inch long $\frac{1}{2}$ inch through, with shorter persistent sepals.

Malacca: Sungei Hudang, Ayer Ular Bulu (Goodenough 1976); Selangor on the stream at the Camphor forest Rawang (Ridley 7349). It is known as K'luet.

From *K. caudata*, King this differs in the larger leaves and shorter: petiole, the almost sessile flowers, the ovate bracts.

TERNSTROEMACEAE.

Adinandra parvifolia, n. sp.

A big tree. Leaves ovate narrowed at the base coriaceous, apex obtuse or rounded glabrous, upper surface pustulate minutely, nerves 8 pairs indistinct above, nerves and reticulations conspicuous beneath, midrib prominent $1\frac{1}{2}$ to 2 inches long $\frac{1}{2}$ to 1 inch across petiole $\frac{1}{4}$ inch long. Flowers large $\frac{1}{2}$ inch across, axillary on long peduncles $\frac{1}{2}$ to nearly 1 inch long. Sepals orbicular pustular coriaceous edges ciliate. Stamens numerous silky. Pistil glabrous.

Perak: Larut Hills, the Cottage (Ridley 5236).

Really I think nearest *A. macrantha*, but the leaves are much smaller than any other species known to me, and ovate sometimes almost obovate.

DIPTEROCARPEAE.

A number of species have been added to this order since the publication of the Materials, among which are

Shorea barbata, Brandis Journ. Linn. Soc. XXXI. p. 81.

This is one of the trees known here as "Resak," and produces a high class timber. It has rather small ovate lanceolate coriaceous leaves with a dense greyish yellow pubescence beneath and long lax panicles of grey buds. The flowers are small with 20-30 anthers bearded at the tip. The pistil is woolly also. This plant has only been collected in Malacca at Batang Malaka by Goodenough (No. 1789) and the fruit is as yet unknown. It is allied to *S. ciliata*, King.

S. gibbosa, Brandis l. c. 99. Is a lofty tree with brown rough bark. The large branches are peculiar in dilating at the base into a kind of triangular boss of large size, as if they were putting out buttresses. The leaves are 4 inches long and two inches across, glabrous dark green and rather thin in texture ovate acuminate. The flowers are small and pink in few flowered secund racemes. The sepals are woolly, the petals glabrous inside and woolly

outside. Stamens ten. The fruit not described by Brandis is elongate nearly cylindric with a short point half an inch long $\frac{1}{4}$ inch through and covered with a fine silky wool; the wings are 5, the three outer ones $2\frac{1}{2}$ inches long narrowed at the base and gradually dilated upwards to the rounded tip where they are $\frac{1}{4}$ inch wide, the 3 inner ones are shorter and narrower 2 inches long, all covered with thin wool.

I have only seen a single tree of this fine Diptero-carp. It grows in the grounds of Rogie, Tanglin on the side of the Garden road. It is distributed under the numbers 6079, 6686.

Sh. rigida, Brandis Icones, Plantarum Tab. 2402.

This is a lofty tree, with rough dark bark on the branches which are covered with lenticels and when young with a kind of scarf also. The shoots are enclosed in bright pink bracts which make the young plants showy. The leaves are large rather stiff 6 inches long or more, quite smooth above, beneath the nerves are much raised, and it is dotted all over with little woolly warts from which on the midrib spring single rather stiff hairs. The flowers are white in clusters on short branches of a loose panicle about 6 inches long, are themselves $\frac{1}{4}$ inch long, with a silky calyx and oblong petals very silky outside and glabrous within. It has 50 stamens with nearly circular anthers. The fruit is ovoid hardly half an inch long the wings are bright red quite glabrous, linear 4 inches long and half an inch wide, (the inner ones 2 inches long and only half as wide), hardly dilated at all for their whole length, finely marked with longitudinal ribs and transverse bars. This fine tree grows in the Garden Jungle (No. 6393) and I met with it too at Perhentian Tinggi (No. 10053). It fruits abundantly and comes up readily.

ANISOPTERA.

Only one species of *Anisoptera* is recorded in the Materials. There are however three kinds known here *A. Curtisi*,

King, easily distinguished by its narrow leaves bright yellow beneath.

A. costata, Korth. Verh. Nat. Gesch. Bot. 67, t. 6. A gigantic tree with large buttresses and rather pale colored bark. Leaves oblong coriaceous with a broad base blunt, glabrous above with close yellowish brown tomentum beneath, nerves numerous close set about 25 pairs, and reticulations distinct beneath, 4-6 inches long and 3 inches wide, petiole $1\frac{1}{2}$ very rough. Panicles axillary and terminal 6 inches long covered with scurfy wool in tufts. Flowers $\frac{1}{4}$ inch long yellow. Sepals lanceolate acuminate densely pubescent. Petals glabrous lanceolate acuminate mucronate. Fruit globular 1 inch through, tomentose, wings two very large 7 inches long $1\frac{1}{2}$ inch wide slightly narrowed at the base and dilated a little upwards rounded at the tip, with three strong nerves running the whole length and numerous transverse bars the other three wings about 3 inches long very narrow with only 2 main nerves. The whole fruit is light brown. Some magnificent trees of this fine plant grow in the Garden Jungle (Distrib. No. 6684) and in Dalvey ground. The leaves in sunlight have a striking coppery yellow appearance specially conspicuous when wind blows. I have it also from Batu Tiga in Malacca collected by Holmberg under the name of Mersawar Ular. It was originally described from South East Borneo. I believe it is the chief source of the timber commonly known as Mersawar which is in quality like a rather inferior Meranti.

A. glabra, Kurz. Flor. Fl. Brit. Burmah i. 112.

A fine straight tree running to 100 feet high, with dark brown bark. Leaves lanceolate acuminate base rounded quite glabrous about 3-6 inches long and $1\frac{1}{2}$ inch wide. The flowers are small and pubescent. The fruit globular, about $\frac{1}{4}$ inch through with linear wings narrowed slightly at the base $3\frac{1}{2}$ inches long and $\frac{1}{3}$ inch wide with three strong ribs and transverse bars. It occurs in the Garden Jungle (No. 6886 fruit).

Malacca: Selandor (Holmberg 841), and Merlimau (N. Cantley), Machap (R. Derry 1166), and is known as Mersawa Merah. It is also a native of Burmah.

Cotylelobium flavum, Pierre Fl. For-Cochinch. fasc. 16 t. 258a.

This is one of the Plants known here as Rassak. It seems to be rare here as I have only seen it from Sungei Morai in Singapore (4630 and 3619a of my collections) and it is not recorded in King's Materials. It has stiff lanceolate leaves quite smooth and polished above and covered with a soft short grey tomentum of minute stellate hairs, the nerves are almost invisible without a lens. The flowers are very numerous in short panicles all covered thickly with stellate woolly hairs about $\frac{1}{5}$ inch long. The fruit which I have not seen is described as tomentose globular the two large wings free to the base 2 inches long, blunt, the other three linear lanceolate acute and only $\frac{3}{4}$ inch long. It is also a native of Sarawak.

Hopea globosa, Brandis l.c. 61. This is based on a plant collected by Wray, at Thaiping, Perak. The only type specimen I have seen is a poor one but I have collected fruiting specimens of a tree rather small for this genus at Chua Chu Kang, in Singapore (No. 6585) and have also received it from Rantau Panjang, in Selangor under the name of Chengal Paya. The leaves are ovate acuminate 4 inches long, rather coriaceous with the nerves prominent on the back. The fruit in Wray's specimen seems young—it is pubescent and does not show the true wing veins. In the others, adult, there are 7 distinct nerves and the wings are glabrous. The large wings are broad and elliptic half an inch wide, the small ones quite small and rounded. Flowers of this tree are much wanted.

Vatica oratifolia, n. sp.

Tree. Leaves ovate acuminate thinly coriaceous base rounded, apex acuminate obtuse glabrous, nerves 6 pairs prominent, reticulations fine and conspicuous, 7 inches

long 4 inches wide, petiole $\frac{1}{2}$ inch long. Panicles lax on the ends of branches about 6 inches long, branches 2-3 inches long, silvery scurfy pubescent. Flowers $\frac{1}{2}$ inch long. Sepals ovate acuminate pubescent $\frac{1}{10}$ inch long. Petals lanceolate obtuse narrowed to the base, backs pubescent, inner surface glabrous, half an inch long $\frac{1}{5}$ inch across. Stamens very short fifteen. Anthers oblong, cells very unequal, connective very short prolonged, filament shorter than the anther dilated at the base. Ovary minutely pubescent, style stiff conic ribbed, stigma capitate papillose. Fruit not seen.

Province Wellesley: Nibong Tebal (C. Curtis 3458).

Vatica Lankaviensis, n. sp.

Leaves elliptic or elliptic lanceolate obtuse base cuneate, coriaceous glabrous nerves 8 pairs prominent on both surfaces closely reticulate on the back, pale in color when dry, lighter on the back 3-5 inches long $1\frac{1}{2}$ -2 inches wide, petiole $\frac{1}{2}$ inch long. Panicles axillary and terminal lax spreading 4-6 inches long, branchlets angled covered with stellate tomentum, pedicels $\frac{1}{10}$ inch long. Sepals fleshy ovate triangular quite blunt, densely tomentose, $\frac{1}{12}$ inch long. Petals spirally twisted thick drying black oblong obtuse half the back covered with stellate tomentum inside glabrous $\frac{2}{3}$ inch long. Stamens 15 very short, outer whorl much shorter than inner ones. Anthers nearly sessile oblong, cells subequal, connective prolonged into a short reddish blunt point longer than the filament, ovary hairy style short thick glabrous, stigma capitate.

Lankawi: Kwah (Curtis 3410).

Vatica Kelsalli, n. sp.

Tree. Leaves coriaceous glabrous lanceolate obtuse nerves about 5 pairs conspicuous beneath, finely and closely reticulate beneath, above dull or slightly shining beneath pale 5 inches long 1-2 wide, petiole half an inch. Panicles axillary and terminal 2-3 inches long, branches numerous short scurfy tomentose. Flowers numerous small white $\frac{1}{6}$ inch long or shorter thick peduncles. Sepals lanceolate obtuse scurfy. Petals little longer ob-

tuse, scurfy. Stamens 10 very short, anthers elliptic, prolongation of connective very short rounded. Pistil glabrous, style short stout, stigma flattened obovate.

Johore: Kwala Sembrong (Kelsall 4064).

TILIACEAE.

Elococarpus rigida, n. sp.

Tree, bark of branches dark colored. Leaves coriaceous elliptic ovate cuspidate margins obscurely crenulate apex obtuse base shortly cuneate quite glabrous, but punctulate nerves 5 pairs elevate on the lower surface, reticulations conspicuous 4 inches long 2 inches wide petiole rather stout $1\frac{1}{2}$ inch long. Racemes axillary from below the leafy portion 2-2 $\frac{1}{2}$ inches long. Flowers white, on peduncles $\frac{1}{5}$ inch long tomentose. Sepals 5 triangular lanceolate pubescent $\frac{1}{10}$ inch long. Petals 5 as long, cuneate laciniate pubescent not glandular. Stamens 15 margins shorter than the petals, filaments very short, anthers linear, with a small tuft of white hairs on the tip. Torus a shallow lobed grey tomentose cup, ovary ovoid grey tomentose. Style longer glabrous.

Singapore: Bukit Timah (Ridley 4949, 3641).

The stiff glabrous leaves are peculiar in this plant. The petals are much laciniate the primary lobes divided into 2 or more filaments. The torus is curiously undulately lobed.

STERCULIACEAE.

Sterculia elongata, n. sp.

Shrub about 10 feet tall, with brown bark. Leaves simple alternate oblong linear acuminate obtuse base slightly narrowed or not, margins entire parallel straight or undulate, glabrous subcoriaceous 6 to 12 inches long 2 inches wide, nerves distinct on the lower surface 18 to 26 parallel meeting in loops $\frac{1}{5}$ inch from the margin, petiole $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, thickened at the apex. Raceme 6 inches long from the upper leaf axil lax about 14

flowered, rachis shortly hairy. Pedicels $\frac{1}{2}$ inch long. Flower pubescent tube campanulate $\frac{1}{5}$ inch long, lobes linear hairy jointed by the tips $\frac{3}{10}$ inch long. Androecium shorter than the tube glabrous, sessile, anthers eight. Female flowers unknown. Carpels 5 when spread open elliptic ovate cuspidate 2 inches long 1 inch wide red pubescent externally. Seeds 4 in each carpel, subglobose.

Singapore: Bukit Timah, Bukit Mandai, Chan Chu Kang (Ridley); Malacca: Bukit Kandong (N. Cantley's coll.).

The long narrow leaves with curiously undulate margins in some specimens, and very numerous nerves with the large flowers distinguish the plant from any known to me.

Sterculia Lancaviensis, n. sp.

Small tree, deciduous producing its flowers in the dry season when the leaves are fallen, bark grey corky wrinkled. Leaves grey when dry obovate apex rounded glabrous with 5 pairs of ascending nerves $3\frac{1}{2}$ inches long $1\frac{1}{2}$ inch wide, petiole $\frac{1}{4}$ - $\frac{1}{2}$ inch long. Flowers in short lax panicles much branched and about 1- $1\frac{1}{2}$ inches long on the ends of the nude branches stellate pubescent. Male perianth campanulate $\frac{1}{8}$ inch long, lobes lanceolate linear obtuse hairy along the edges. Stamens six in a globose capitulum on a filament as long as the tube. Females perianth campanulate with ovate lobes, $\frac{1}{5}$ inch long, lobes very short scabrid pubescent inside glabrous with 12 strong raised veins, stamens 5 sessile in a small globose tuft.

Lankawi islands: Kwah (Ridley), Terutau (Curtis 3414).

Apparently nearest to *S. bicolor* but with different leaves, and not pubescent beneath, as I can see no pistil. I imagine it has been eaten off by something.

Sterculia pubescens, Masters Fl. Brit. Ind. i. 357.

A large tree. Leaves ovate to elliptic rounded at the tip or abruptly cuspidate base rounded, coriaceous glabrous above drying pale 4 inches long $2\frac{1}{2}$ inches wide,

beneath densely rufous tomentose with hairs stellately arranged, nerves about 8 pairs, 4 inches long, $2\frac{1}{2}$ inches wide, petiole densely rufous hairy about an inch long. Panicles 6 inches or more long rufous-tomentose, with numerous short branches half an inch or less long. Flowers very small densely tomentose, $\frac{1}{10}$ inch long. Calyx campanulate cleft half way into 5 short ovate acute lobes hairy on both surfaces. Male androecium small the length of the tube, filaments slender nearly as long as the tube, anthers 8 in a globose mass. Females not known. Carpels 4 ovate shortly beaked, when expanded outside densely tomentose, inside densely hairy. 2 inches long and $1\frac{1}{4}$ inch broad. Seeds 4 black.

Penang: Waterfall (Curtis 2762); Lankawi: Terutau island (Curtis) fruits.

I take this to be the very imperfectly known and described *pubescens*, Mast., based on a specimen collected by Maingay in "Malacca" but probably in Penang. The fruiting specimens from Terutau seem to me to be identical as far as I can see with the Penang one which is in flower.

Sterculia hispidissima, n. sp.

Shoots covered thickly with rough red hairs. Leaves crowded at the ends of the branches elliptic or oblong entire with a broad truncate base, shortly cordate, blade dilated a little in the middle, and slightly narrowed to the cuspidate tip, texture rather thin, above covered with scattered rough pale hairs, and on the nerves and reticulations small stellate tufts of hairs, distant, beneath more thickly covered with stellate hairs and long rough hairs; midrib densely tomentose with stellate hairs, and numerous pale rough hairs interspersed, 4 to 6 inches long, 2-3 inches wide, nerves 7-10 pairs petioles half an inch long red hairy. Panicles numerous crowded at the ends of the branches 6-8 inches long densely rough hairy, branches short 1 inch or less with few short slender branches hairy. Flowers $\frac{1}{3}$ inch long tube campanulate as long as the linear ciliate lobes. Androecium one third

as long as the tube, anthers 8. Female flowers and fruits not seen.

Selangor: Ulu Gombak (Burn-Murdoch No. 153).

I have a sheet of this curious *Sterculia* in Cantley's collections made about 1885, with a Singapore ticket on it but no locality, and recently Burn-Murdoch sent it from Selangor. It is remarkable for its great hairiness being covered with two kinds of hairs, one long slender pale, the other velvety hairs in small tufts..

BURSERACEAE.

Trigonochlamys grandifolia, n. sp.

A tree, leaves over a foot long, the petiole 4 inches long or less, densely covered with red tomentum, leaflets opposite three pairs and a terminal one, elliptic obtuse or cuspidate, base rounded or shortly cuneate, margins denticulate, stiffly coriaceous, above glabrous beneath covered with red tomentum, nerves 12 pairs strongly elevated beneath with elevated transverse nervules petiolules $\frac{1}{4}$ inch, densely red tomentose as is the rachis, leaflets 6 inches longer less 2 inches wide. Panicle shorter than the leaves. Male about 6 inches long, female shorter, all densely red tomentose, with few short branches. Flowers crowded, sessile half an inch long. Male flowers on longer panicles than the females. Calyx campanulate half an inch long with deltoid acute lobes $3, \frac{2}{5}$ inch across, very coriaceous and densely red hairy. Petals 3, as long thinner lanceolate obtuse, back centre hairy, margins glabrous. Stamens 3 glabrous filaments free to the base, anthers lanceolate connivent. Disc annular setose. Female flowers rather larger and fewer. Calyx and corolla as in the male. Stamens shorter than the style, ovary conic densely tomentose, style stout. Fruit unknown.

Singapore: Bukit Timah (Ridley 10735) male without locality (Cantley) female.

One species only of this genus has been as yet described, *Tr. Griffithii*, a tolerably common tree. This

new species is very distinct in its large hairy leaves, and big flowers with only three stamens. In habit it has quite the appearance of a *Canarium* such as *C. rufum*, but has the large flowers of *Trigonochlamys*.

MELIACEAE.

Aglaia salicifolia, n. sp.

A shrub or small tree, glabrous except the inflorescence. Leaves 6 inches long, with 5 leaflets, rachis glabrous, leaflets nearly sessile narrowly lanceolate acuminate at each end equally coriaceous glabrous nerves invisible above, 12 pairs, ascending slightly elevate beneath 4 inches long $\frac{1}{2}$ - $\frac{3}{4}$ inch wide. Panicle 6 inches long or less with slender branches, and short branchlets. Rachis scaly, branches and pedicels scurfy. Flowers $\frac{1}{2}$ inch long globose yellow on pedicels longer than themselves. Sepals 5 very short ovate scurfy. Petals 5 oblong much longer glabrous. Staminal tube oblong free glabrous. Anthers moderately large. Style none. Stigma capitate large. Fruit elliptic nearly $\frac{1}{2}$ inch long glabrous on the thickened panicle.

Pahang: Tahan River (Ridley 2660). "Poko Tado Ikan."

I considered this at first as probably what Miquel intended by his *A. Diepenhorstii*, but on comparing it with the description I conclude that it is distinct in the size and shape of the leaves, very characteristic on this plant, and other minor points.

Aglaia rufa, Miq. Ann. Mus. Lugd. Bat. IV. 49.

Stems densely covered with thick red stellate hairs. Leaves a foot or more long, (probably very large) petiole stout 6 to 9 inches long densely red hairy, leaflets 4 pairs sessile oblong cuspidate subherbaceous, covered with scattered stellate hairs on both sides and crowded on the midrib 4-6 inches long 3 inches wide. Panicles shorter than the leaves much branched densely hairy 6-12 inches long in the axils forming a dense mass. Flowers minute

shortly pedicelled. Sepals 5 ovate acute, with one or two tufts of stellate hairs longer than the flowers. Petals 5 smaller orbicular glabrous. Staminal tube free semi-globose, 5 anthers, glabrous.

Malacca (N. Cantley). "Tambu Gulong" timber used for beams, and the fruit is edible sweet."

I have seen no other specimens of this curious species, remarkable for the dense covering of red hairs stellately arranged all over it, no leaves on the two sheets are complete, so I cannot give the exact size.

Walsura villosa, (Wall. Cat. 1264) Dec. Prodr. p. 636.

Leaves under 6 inches long, leaflets five elliptic acuminate, 3-5 inches long $1\frac{1}{2}$ inch wide, thinly coriaceous pale glabrous shining above glaucous beneath when dry, nerves 6 pairs slender, petiolule $\frac{2}{5}$ inch long, rachis triquetrous. Panicles 14 inches long minutely pubescent lax, branches $1\frac{1}{2}$ inch long with the branchlets crowded at the top. Flowers shortly pedicelled $\frac{1}{7}$ inch long. Calyx lobes 5 ovate acute pubescent. Petals longer about twice as long oblong pubescent. Stamens 10 nearly free to the base, filaments broad linear hairy. Anthers on the tips rounded pubescent. Ovary silky hairy.

Perak: at Kamuning (Ridley 3022).

This plant which is not recorded in the Materials for a flora of the Malay Peninsula, is a native also of Tenasserim.

OCHNACEAE.

Gomphia corymbosa, n. sp.

A shrub 6 to 8 feet tall or a small tree about 20 feet tall. Leaves oblong coriaceous to lanceolate subacute 4-4 $\frac{1}{2}$ inches long 1-1 $\frac{1}{2}$ inches wide dark shining green, petiole $\frac{1}{5}$ inch long. Umbels on the ends of short branches many and dense flowered, one inch to nearly 2 inches across. Bracts oblong ovate coriaceous convolute round the base of the pedicel $\frac{1}{10}$ inch long obtuse. Pedicel $\frac{1}{4}$ inch long slender. Flowers $\frac{1}{4}$ inch across pure white. Sepals oblong obtuse apex broad deflexed. Petals linear obtuse much narrower. Stamens 6-9, fila-

ments short. Anthers longer oblong. Ovaries 5. Styles short. Carpels obovate reniform. *Gomphia Hookeri*, var. *corymbosa*, King Mat. Fl. Mal. Pen. Vol. I. 475.

Singapore: Top of Bukit Timah (Ridley 10738); Perak: Goping (King's Coll. 4673).

Gomphia Hookeri is a shrub frequenting sandy places near the sea, with deep crimson flowers in small umbels. This plant is as regards the Singapore plant at least, (the type) a tree frequenting forests, with larger umbels of smaller pure white flowers.

Euthemis minor, Jack Mal. Misc.

This was described by Jack from specimens found in Singapore with the common *E. leucocarpa* Jack, but though I have met with it in Pulau Batam and King records it from Bangka, it appeared to have become extinct in Singapore, I was therefore very pleased when on visiting the banks of the river at Chua Chu Kang to find a quantity of this pretty plant growing with *E. leucocarpa* in the sandy woods above the river. King's description of it is very poor. He merely mentions that its leaves are obscurely veined, a difference which is hardly noticeable in the living plant, and that the leaves are nearly entire, and the berries red. These he gives as distinguishing points, but the berries of *E. leucocarpa* are as often red as white, varying from white to rose and rose to deep red. Jack's description is fuller and gives the points of this plant well. It is smaller and more prostrate than *E. leucocarpa* with dark brown bark. The leaves are more distant and much smaller 3 to 4 inches long $1\frac{1}{4}$ wide or even smaller narrowly lanceolate dark green above and paler beneath, the petiole is winged to the base as in *leucocarpa* but much less distinctly so. The surface of the leaves is quite smooth and though the thickened edge is serrate the minute thorns which arm the teeth are very inconspicuous and often not developed at all. The panicle is very distinct. It is much longer than the leaves, nearly 6 inches long and quite lax, hardly branched, the flowers being mostly in pairs, with green

lanceolate persistent bracts $\frac{1}{4}$ inch long. The flowers, open one in each pair at a time, after which the pedicel elongates somewhat so that the young fruit of one pair is well developed before, the second flower is open. The sepals are ovate ciliate, $\frac{1}{10}$ inch long, green, becoming pink as the fruit ripens and fallen before the fruit is ripe. The whole flower is smaller than that of *E. leucocarpa*. The petals are linear oblong white, and the stamens much resemble those of that species. The ovary is brighter green and conic but angled, while that of *leucocarpa* is nearly white and quite smooth and rounded. The fruit is quite different. It is strongly five angled, and this is most conspicuous before it is ripe and when still green, but when fully ripe the angles are still visible and the top of the fruit nearly flat and very dark red, not at all resembling the globose round topped fruit of *E. leucocarpa*. The plant grew in some abundance in one spot in a sandy wood, where *E. leucocarpa* (some plants of which attained a height of over six feet) was plentiful, and *Dipteris Horsfieldii* formed a large thicket. It was probably more abundant in Singapore at one time as it is not probable that Jack reached this part of the island which must in his time have been quite inaccessible. There is no evidence of its occurrence in Penang as mentioned by Hooker in the Flora of British India.

SAPINDACEAE.

Capura pulchella, n. sp.

Shrub little branched about 6 feet tall. Leaves with 4 or 5 leaflets, elliptic lanceolate coriaceous dark green, nerves inconspicuous 8 pairs, 6 inches long or more 3 inches across, petiolule $\frac{1}{10}$ inch long; petiole 3 inches long. Stipules ovate obtuse 2 inches long $1\frac{1}{2}$ inch wide, all glabrous. Racemes slender 6 inches long, with distant flowers about 20, glabrous. Bracts minute lanceolate acuminate 1 mm. Peduncles very short thick each bearing 1 or 2 flowers. Pedicels $\frac{1}{10}$ inch long. Sepals 4

ovate rounded glabrous reflexed cream color with minute red spots as long as the pedicels. Petals oblong obtuse larger margins ciliate creamy straw color, 4. Stamens 8, filaments short white ciliate cylindric. Anthers longer elliptic flattened yellow, pollen yellow. Disc annular cushioned, rose pink surrounding the stamens and pistil. Pistil small, ovary free, conic stigmas 2 pink. Cells 2, ovales 2. Fruit drupaceous 1-2 seeded, at first red thin black.

Borneo: Kudat (Ridley).

This pretty shrub, I found some years ago near the sea in Kudat, and have had in cultivation in the Botanic Gardens since. It is quite attractive with its sprays of yellow flowers and red fruit, and its curious stipules. The petals are rather peculiar in shape. They are minutely clawed at the base with a short cylindrical claw. The lamina projects inwards just above forming a small sac at the base.

C. Hullettii, n. sp.

Branches slender dark when dry. Leaves simple, lanceolate acuminate with a long point rounded at the tip, slightly narrowed at the base quite glabrous, nerves 6 pairs conspicuous beneath, 5 inches long 2 inches wide, petiole 1 inch long swollen and geniculate for about half its length. Stipules ovate rotundate to orbicular cordate at the base and shortly petioled, coriaceous half an inch long. Panicles very lax 3-4 inches long with few branches 2 inches long or less. Flowers on pubescent peduncles $\frac{1}{4}$ inch long. Sepals 4 small $\frac{1}{10}$ inch long ovate acute pubescent. Petals 4 $\frac{3}{10}$ inch long linear oblong stellate pubescent. Stamens 8, filaments very short glabrous. Anthers oblong apiculate. Disc small annular glabrous. Ovary conic pubescent, style cylindric glabrous with a conic stigma with several minute lobes, much longer than the stamens.

Malacca: Mt. Ophir (Hullett 781).

The genus *Capura* was based upon a Philippines plant, *C. pinnata*, Blanco (*C. nigrescens*, Villar) to

which both these species seem allied. The genus *Otophora*, Bl. has been added to *Capura* but there seem to be sufficient characters to keep them separate.

AMPELIDEAE.

Vitis (*Ampelocissus*) *floccosa*, n. sp.

A slender-stemmed vine of the habit of *V. gracilis*, stems covered with loose red felted tomentum. Leaves entire ovate cordate acute, 2 to 4 inches long and as wide, margins entire except for glands at the ends of the nerves, above glabrous (black when dry) beneath covered with dense red tomentum thickly felted, beneath punctate, nerves about 5 pairs, reticulations beneath conspicuous, petiole 1 inch long densely covered with red tomentum. Stipules small caducous. Tendrils slender unbranched glabrescent. Inflorescence very slender about 8 inches long, peduncle $2\frac{1}{2}$ inch long, branches distant $\frac{1}{2}$ -1 inch long, slender usually simple, with few 12-14 very small distant flowers. Rachis tomentose, flowers sessile $\frac{1}{27}$ inch long. Calyx saucer-shaped short obscurely toothed glabrous. Corolla oblong obtuse glabrous much longer, tetramerous. Stamens rather large 4. Ovary hemispheric. Berry oblong rounded glabrous $\frac{1}{2}$ inch long when dry, seeds 3 boat-shaped $\frac{3}{10}$ inch long, back convex, with a faint channel down the centre, front acutely angled, all minutely pustular.

Johore: Gunong Pulai (Ridley 3114).

This plant is allied to *V. gracilis* differing in its dense felted tomentum.

ANACARDIACEAE.

Swintonia Robinsonii, n. sp.

Tree, branches dark colored. Leaves stiffly coriaceous lanceolate subobtuse narrowed slightly at tip and base, nerves about 15 pairs not very conspicuous 6 inches long 2-2 $\frac{1}{4}$ inch wide, petiole 1 $\frac{1}{2}$ inch long, dark colored.

Panicles short in flower about 3 inches dilating later to

about 6 inches. Peduncles and pedicels angled, grooved pubescent when young. Bracts small caducous, ovate edges pubescent. Pedicels shorter than the flowers. Sepals rounded ovate pubescent especially on the margins much shorter than the petals. Petals oblong lanceolate obtuse glabrous outside, pubescent on the inner face, $\frac{1}{2}$ inch long. Stamens 5 filaments slender glabrous shorter than the petals. Anthers ovate. Ovary subglobose glabrous. Fruit small, as big as a pea, petals $\frac{1}{4}$ inch long.

Pahang: Gunong Tahan (Robinson 5391).

In working over the study set of the Gunong Tahan plants in the British Museum, I only saw fruiting specimens of this tree but in specimens of other sets I was fortunate enough to find flowers, so I herewith describe it, as it seems to be distinct from any other species. The fruit appears to be nearly full size and is very small for the genus. The leaves are not pale colored underneath, as in most species, and the petals are pubescent within. This species is most closely allied to *S. puberula*, Pears. of Bujong Malacca, in Perak, differing in its larger leaves with fewer veins, and its petals glabrous outside, and less pubescent angled pedicels.

Campnosperma oxyrrhachis, Engl. Anacard. 319. Of this plant only the leaves have apparently ever been described, and I have seen no type, but the plant to be described below has been identified many years ago at Kew as *C. oxyrrhachis* and the leaves resemble the description given, so I propose to describe the inflorescence, and habit.

A small straight tree not rare in open country, among thickets but seldom flowering, little branched. Leaves oblanceolate winged completely to the base, margins undulate apex cuspidate gradually narrowed to the base, petiolate 15 inches to $3\frac{1}{2}$ feet long $4\frac{1}{2}$ -7 inches wide, above glabrous shining when dry, nerves over 30 pairs fine and not very conspicuous above, elevated beneath reticulations conspicuous numerous beneath, back

of leaf closely scurfy, midrib semiterete elevated. Panicle large terminal much branched, branches often over 18 inches long slender lax spreading, hairy with short rough hairs. Flowers small green in short cymes. Bracts small linear hairy. Calyx lobes rounded ovate pubescent 5. Petals valvate oblong obtuse glabrous 5. Stamens 5 shorter than the petals, glabrous, anther elliptic. Pistil conic ovoid hairy.

Malacca: Low ground near Ophir (Hullett); Pahang: Tahan River (Ridley 2569), Kwala Lipis (Machado).

The original description was from a plant obtained in Sumatra at Tarentang by Miquel who described it as *Buchanania oxyrrhachis*, Fl. Ind. Bat. Suppl. I. 524. It will be noticed in the description I have given above that the midrib can hardly be called "acutangled," even at the tip, below it is distinctly rounded and often grooved. I believe I have seen it very commonly all over the low country of the Peninsula, but it very rarely is met with in flower and I have never seen fruit.

Semecarpus glomerulatus, n. sp.

Bark grey. Leaves obovate apex rounded base narrowed to the petiole, margin undulate, coriaceous glabrous above, beneath nerves and reticulations covered with short red hairs, nerves about 10 pairs, meeting in arches at the margin reticulations numerous and prominent visible on both surfaces but most elevated beneath 4-8 inches long $2\frac{1}{2}$ -5 wide petiole pubescent $\frac{1}{4}$ - $\frac{1}{2}$ inch long thick. Panicle 8-12 inches long with numerous spreading branches 4 to 6 inches long, rachis closely valvety pubescent. Flowers in distant glomeruli very numerous $\frac{1}{10}$ inch across. Pedicels very short pubescent. Calyx shallow with 5 very short lobes, pubescent. Petals 5 glabrous ovate lanceolate subobtuse valvate. Stamens 5 filaments slender about as long as the petals glabrous. Disc broad flat fleshy hairy in the centre.

Lankawi: Pulau Nior Stali (Curtis 3681).

SABIACEAE.

Meliosma elegans, n. sp.

A small tree 20 to 30 feet tall branches black when dry. Leaves unequally pinnate 6-8 inches long leaflets opposite 3-5 pairs, lanceolate acuminate base cuneate 2 inches long 1 inch wide glabrous except for a few fugacious reddish hairs on the petiolule and midrib, petiolule $\frac{1}{4}$ inch long. Panicle lax a foot long, with distant long slender branches 6 inches long or less branchlets 1-2 inches. Flowers subsessile small pink fragrant. Rachis everywhere covered with scattered red hairs. Calyx lobes narrow lanceolate obtuse 4 or occasionally 5 margins ciliate. Petals glabrous 5 outer ones orbicular, inner ones narrow oblong hooded. Stamens 3 glabrous, hooded with a bilobed rounded cup surrounding the anther. Pistil conic pubescent narrowing to a slender style. Fruit small pisiform with a low keel running on one side $\frac{1}{4}$ inch through.

Selangor: above the Gap, Gunong Semangkok 3-4000 feet alt. (Curtis 3754).

I cannot match this elegant plant with any described species.

Meliosma monophylla, n. sp.

Leaves simple elliptic acuminate with a rather long blunt point, narrowed to the base, thin in texture glabrous shining, the nerves slender 7 pairs usually visible above meeting in arches near the margin, length 6 to 8 inches, width 3 to $3\frac{1}{2}$ inches; petiole slender thickened at the base $1\frac{1}{2}$ to 2 inches long. Panicles axillary or terminal 2 to 3 inches long with a slender peduncle about an inch long glabrous, branches few except in the terminal one, and short. Flowers $\frac{1}{10}$ inch long shortly pedicelled. Sepals 5 suborbicular, unequal, margins ciliate. Petals 5, three orbicular glabrous, 2 smaller irregular. Stamens 2 fertile. Anthers decurved with a rather wide connective 3 irregular sterile, lobed, adnate at the base to the petals. Ovary conic glabrous.

Perak: Hermitage Hill (Ridley) a single specimen collected in 1892.

Very distinct from any species known to me is its thin textured simple leaves and general glabrous habit, the flowers too are fewer and larger than usual.

MELASTOMACEAE.

Anerinoleistus pauciflorus, n. sp.

Much branched shrub about 6 feet tall, stems terete. Leaves elliptic ovate acuminate winged on the petiole glabrous above and beneath except a few hairs on the midrib, 7 inches long 3 inches wide, 5 nerved, with straight parallel transverse conspicuous nerves, petiole 1 inch long, winged in the upper part covered with rough pale hairs as are the young parts. Flowers 2 or 3 in a small raceme terminal on a very short peduncle. Bract hairy ovate acuminate obtuse $\frac{1}{4}$ inch long. Calyx lobes fleshy linear, hairy $\frac{1}{16}$ inch long. Petals ovate acute bright rose pink margins minutely ciliate. Stamens 8 equal and similar filament flat linear narrowed at tip glabrous pink. Anthers longer hardly sagittate base of cells rounded, acuminate upwards opening by terminal pores, glabrous with a pair of short processes or warts rising from the base of an oblong thickened connective. Style thick cylindric. Capsule $\frac{1}{4}$ inch long thickly roughly hairy splitting above into 8 linear lobes.

Selangor: Klang Gates almost out of flower, Aug. 1908.

A much bigger plant than *A. macranthus*, King, with hairy calyx tube and with the capsule valves splitting into 8 linear lobes. From *A. hirsutus*, Korthals, it differs in the very short inflorescence the large bract and the dehiscence, and larger more glabrous leaves.

Ochthocharis ovalifolia, n. sp.

A shrublet branched with pale bark young parts covered with dark red curly hairs. Leaves opposite ovate acute or acuminate base rounded, margin crenulate with

short thorn-like processes, nerves 5 from the base, transverse bars conspicuous beneath above glabrous except on the midrib at the base, beneath pale, the nerves and reticulations covered with curly red wool, $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long $1\frac{1}{4}$ inch wide, petiole red woolly $\frac{1}{2}$ inch long or less. Panicle short terminal, with few short branches and few flowers, red woolly at the nodes. Bracts oblong $\frac{1}{10}$ inch long, glandular hairy. Calyx $\frac{1}{2}$ inch long, campanulate with short lanceolate triangular lobes, edged with gland tipped hairs. Corolla. Petals 5 lanceolate acuminate ending in a short hair-like mucro. Stamens 8 all similar filaments moderately stout, anthers as long linear oblong obtuse, with a solitary glandular boss at the base on the back. Ovary glabrous, style stout nearly as long as the petals, stigma capitate. Fruit capsular, subglobose, sepals ciliate, top hardly elevate nearly flat, dehiscence apparently irregular, $\frac{1}{5}$ inch long. Seeds numerous fawn colour cuneate truncate at the top, raphe thickened conspicuous.

Johore: in dense swampy woods at Sedenah Aug. 1908 (Ridley).

The normal number of stamens in this genus are 10 but I could only find 8 in the flower I examined. The plant was almost out of flower, at the time, and the flower might not be normal. The small usually ovate leaves closely toothed, small panicle, and rufous hairs on the young parts distinguish it from other species.

BEGONIACEAE.

Begonia paupercula, King.

I have not seen the type of this species nor is there any record further than Perak as to where the original plant was obtained, but there is a small species of *Begonia* abundant at the Kwala Lumpur caves, which I think may be intended by this description. The plant however described from dried specimens only differs somewhat from King's description and thus I describe the Kwala Lumpur

plant from the living plants brought from the caves, where it grows abundantly. A small succulent herb with a creeping not swollen rhizome, four to 6 inches tall; the stem pinkish, completely glabrous except for a few glandular hairs on the edges of young leaves, and some scattered processes, (trichomes) on the upper surface. Leaves ovate acuminate blunt cordate at the base unequally bilobed, nerves 5 to 7; 4 inches long $2\frac{1}{4}$ to 3 inches wide, polished light green, or in some plants darker with white spots, petiole 2 to 3 inches long pinkish. Peduncle 3 inches long, with a side branch and small leaf about half-way. Cyme terminal small, and few flowered. Bracts lanceolate white with red veins. Male flowers. Sepals 2 orbicular ovate obtuse, retuse or entire white with red nerves, $\frac{1}{4}$ inch long. Petals 2 smaller, spatulate white retuse. Staminal column globose. Anthers subglobose not apiculate. Female flower $\frac{1}{2}$ inch across. Sepals and petals 6 or 7 very unequal, 4 obovate white lined with red, the others narrower subspatulate white. Styles 2 separate from near the base yellow. Fruit with three unequal wings, two short one long oblong subtriangular blunt half an inch long.

On Limestone rocks Caves near Kwala Lumpur.

It will be noticed that King's *B. pauperula* differs in description in the absence of petals in the male, and apiculate stamens, and the larger number of perianth lobes in the female.

Begonia clivalis, n. sp.

Small succulent herb, with a short rhizome 4 to 8 inches tall. Stems red pubescent hairy, once or twice branched above. Leaves orbicular ovate to ovate cordate, lobes nearly equal, tip rounded thin textured, margin undulate with few short teeth, above and beneath covered with stellate hairs, main nerves 7, spreading from the leaf base 1-3 inches long, $\frac{3}{4}$ to 3 inches wide. Petiole $\frac{1}{10}$ -2 inches long, densely stellate hairy. Inflorescences 3, lax few flowered 2-4 inches long pubescent. Bracts lanceolate $\frac{1}{10}$ inch long. Male flowers on slender pedicels

$\frac{1}{2}$ inch long. Sepals 2 ovate rounded, $\frac{1}{5}$ inch long. Petals 2 narrower and shorter obtuse linear oblong. Stamens in a globose head rather few. Anthers subglobose not apiculate. Female flowers sepals 2 oblong red. Petals nearly as large 2, white. Styles 3 separate nearly to base. Stigmas curved capitate. Fruit capsule red three winged, $\frac{1}{4}$ inch across, 2 wings short triangular, one longer triangular obtuse.

Selangor: Klang Gates on sandy banks, Aug. 1908 (No. 13523); Pahang track (Ridley 8591).

A pretty dwarf begonia with bright red stems and nerves of leaf, allied to *B. Forbesii*, King. The Pahang track plant is rather stouter and less hairy, but I think is the same.

RUBIACEAE.

Xanthophytum rapestre, n. sp.

A little shrub about 6-8 inches tall branched stems slender light brown densely covered with long silky appressed, and somewhat felted hairs pale brown. Leaves obovate to ovate acuminate acute at both ends, subcoriaceous glabrous dull green above densely white felted beneath, nerves ten pairs prominent beneath, reticulations beneath conspicuous, 1-2 inches long $\frac{3}{4}$ -1 inch wide petiole very short $\frac{1}{8}$ inch long. Stipules as long as the petiole ovate acuminate. Inflorescences axillary, paniced of two branches, scorpioids. Flowers 10 in a panicle, all woolly. Pedicels very short peduncle none. Calyx lobes 5, triangular acute deep green. Corolla $\frac{1}{4}$ inch long white woolly hairy, tube narrow at base then abruptly dilated, lobes 5 short ovate mucronate, tube hairy both within and without. Stamens 5 included, adnate to the tube, with very short filaments. Anthers oblong yellow, with a short mucro at the tip. Style included, rather stout. Stigma oblong large, stigmatic surface yellow, capitate transversely grooved. All glabrous, disc annular black. Fruit $\frac{1}{8}$ inch long cylindrical-turbinate felted

2 celled, with numerous angular seeds on an axile placenta. Seeds reticulate dotted brown angular.

Loc. Selangor at Klang Gates, a quartzite dyke alt. 600 feet, flowering August 15, 1908 (Ridley No. 13414).

The genus *Xanthophytum* is based on a plant discovered in Java by Reinwardt and is allied, if indeed it can be considered distinct to *Lerchea* also a Javanese plant. There are two or three species of the genus recorded, one or two from Java, one from Borneo and one from the Society islands. I have seen none of these species, but this plant is evidently (from description) allied to *X. fruticosum*, Miq. of Java. Its most important difference lies in the position of the stamens, which are not adnate to the base of the corolla, but in the mouth of the corolla. In this it most resembles *Lerchea*. But the whole habit of the plant is different from that genus and more resembles that of *Xanthophytum*.

The locality in which I found this curious little plant is of some interest. It consists of a large dyke of quartzite attaining a height of over 1000 feet above sea level. This altitude the short time at my disposal did not permit me to ascend, and the plant was actually gathered on a lower part of the ridge at about 600 feet above sea level. The ridge is of no great width at this point, and is precipitous on both sides. The soil is somewhat peaty and scanty, the rocks projecting bare in many parts. In the crevices of the rock the plant was growing. The whole ridge is very dry, and was exceptionally so at my visit as rain had not fallen for more than a week. Many of the trees and shrubs were out of flower, but the *Xanthophytum* was in good bloom. The lower part of the upper ridge was covered with bracken, *Pteris aquilina*. Above where the soil was more scanty was abundance of the grass *Eriachne Chinensis* very characteristic of dry spots. I saw no other grass there. *Boeckia frutescens* in flower, as a low shrub, was abundant. This is common at high altitudes in dry spots all over the Peninsula, usual-

ly at 3000 feet and upwards, and is stated to be a sea shore plant in Tringanu and near Sandakan. *Rhodoleia championi* was in fruit. This is also a mountain plant, which I have never seen at a lower altitude than 3000 feet. *Cibotium Barometz* and *Oleandra neriiformis* grew under the shade of this and other trees; the latter being also a characteristic fern of our higher hills at 3000 feet altitude. There were a number of other trees of stunted growth on the ridge, none of which were in flower or fruit, but they had all the facies of the trees and shrubs of such hills as Mt. Ophir, and Kedah Peak at 4000 feet elevation. The most conspicuous and abundant plant however was *Pogonantha pulverulenta*, a common plant occurring as an epiphyte in the low country, in mangrove swamps, and on lofty trees in the forests and often establishing itself when fallen from a tree, on the ground in dry exposed spots and also met with on rocks and trees in the higher hills.

The flora of this ridge may therefore be considered truly xerophytic, and totally different from the flora of the Batu Caves limestone district at no great distance and from the forests of the Kwala Lumpur environs.

Chasalia pubescens, n. sps.

A bush about 5 feet tall much branched, stems soft glabrous when adult, lower internodes about 4 inches long. Leaves herbaceous lanceolate acuminate caudate narrowed to the base, primary nerves about 8 pairs looping within the margins, above glabrous beneath paler, sprinkled all over with pubescence, the keel, nerves, and petiole densely pubescent, 6-7 inches long, 2-2½ inch wide, petiole ¼-½ inch long. Stipules ⅓ inch long 2-ovate obtuse pubescent. Cyme compound dense, short 1 inch long, pubescent, pale rosy white. Flowers small sessile in small heads. Calyx short cup-shaped ⅓ inch long with 5 short teeth; pubescent. Corolla ⅓ inch long, pubescent except at the base tubular curved, lobes fleshy short, linear hooded obtuse, hairy outside glabrous within. Stamens 5 glabrous, anthers linear not cordate rather

large, filaments short. Style slender bifid nearly to the base, ovary glabrous cylindric oblong depressed at the top, a little taller than the calyx lobes.

Johore: in woods at Sedenah, hardly out in Aug. 1908. The flowers are white the buds tinted at the tip with lilac.

This species is very distinct from *C. curviflora* in its pubescence and congested flower heads.

ORCHIDEAE.

Microstylis nemoralis, n. sp.

Stem fleshy purple cylindric creeping ascending, 6 inches long. Leaves ovate acuminate, 4 to 9 red, base rounded, five nerved, 3 to 4 inches long, 2 inches wide. Raceme 5 inches tall, base nude, rachis angled, with a few 2 or 3 linear, narrow bracts $\frac{1}{4}$ inch long. Flowers $\frac{1}{4}$ inch across, fairly numerous, close together. Sepals elliptic broad rounded at the tip, strongly reticulate nerved when dry, lower ones broader than the upper ones. Petals linear obtuse narrow, all red. Lip orange-yellow, broad with broad rounded auricles, limb obovate rounded almost quadrate, apex broadest with two rounded angle-lobes, and 5 acute teeth between. Column small pale.

Johore: at Sedenah in wet mud between tree-roots, in a dense wet forest, August 1908.

A very distinct and pretty plant, with the elongate stem of *M. micrantha* but with much larger leaves and flowers. Among Scortechini's drawings is a pencil sketch of a *Microstylis* which I think is intended for this plant. It is labelled *M. plantaginea* by Sir Joseph Hooker, but is not what I take to be the plant he so named in the Flora of British India of which there is another drawing of Scortechini's so labelled.

Liparis Brookesii, n. sp.

Rhizome short, pseudobulbs $\frac{3}{4}$ inch long $\frac{1}{4}$ inch through at the base, subcylindric but base dilated, covered with loose pale ovate sheaths acute ribbed with 8 to 10

ribs. Leaf solitary lanceolate narrowed to the base $3\frac{1}{2}$ - $4\frac{1}{2}$ inches long 1 inch wide thin textured many nerved, acuminate. Scape lax flowered 1 foot long slender base nude for 4 inches except for 2 or 3 linear, acuminate bracts $\frac{1}{4}$ inch long. Flowers remote about 7. Bracts linear acuminate narrow $\frac{1}{4}$ inch long. Pedicel slender half an inch long. Sepals linear oblong $\frac{1}{4}$ by $\frac{1}{10}$ inch long obtuse. Petals very narrow linear. Lip orbicular entire margins minutely crenulate, half an inch long and wide, callus at the base oblong obtuse indented and excavate in the front so as to appear double. Whole flower pea green with a darker spot at base of lip. Column graceful $\frac{1}{4}$ inch long with rather long low wings.

Borneo: Sarawak on limestone rocks at Bidi (C. J. Brookes).

The nearest species to this plant is I think *Liparis tricallosa* Rehb. fil. of the Sulu Archipelago. It differs in its laxer spike coloring of the flowers and orbicular lip with the very different callus. The callus is rather difficult to describe. It has the appearance of being formed by two portions of nerves picked up into a short elevated part, with a depression in front where the veins had begun to bifurcate.

Dendrobium (§ *Desmotrichum*) *crenicristatum*, n. sp.

Branches fairly stout $\frac{1}{10}$ inch through, internodes an inch long yellowish green, pseudobulbs linear oblong flattened grooved yellowish green 3 inches long, $\frac{2}{5}$ inch wide, leaf lanceolate, 8 inches long $1\frac{1}{2}$ inch wide coriaceous. Bracts lanceolate acute papery $\frac{1}{4}$ inch long. Pedicel slender. Sepals reddish $\frac{1}{4}$ inch long lanceolate acuminate acute mentum horizontal cylindric acuminate yellow half an inch long. Petals narrow lanceolate acuminate acute. Lip base narrow linear, lateral lobes decurrent free, points short triangular lanceolate; mid-lobe, claw very short, limb dilated oblong ovate sub-acute, margins undulate and crenulate, with short rounded lobules; keels 2 running from the tip base to the apex nearly as tall as the side lobes, straight to the

midlobe where they are strongly undulate; base of lip pink, limb apricot colored. Column rather tall, with broad pale wings flanking the stigma, anther quadrate large.

Borneo: Sarawak, Quop (Hewitt).

Most nearly allied to *D. roseo-punctum* Ridl. rather conspicuous for the long mentum, and the broad stelidia.
Dendrobium Lankaviense, n. sp.

A slender plant with a tuft of slender stems, thickening slightly upwards, and often branched, above 8 inches long and as thick as a crowquill, red when young, and grey when old, lower internodes an inch long. Leaves narrow lanceolate acuminate acute, $1\frac{1}{2}$ inches long, $\frac{1}{4}$ inch wide. Flower solitary from the nude stem, on a pedicel of half an inch long covered porrect. Sepals ovate lanceolate obtuse $\frac{1}{2}$ inch long, $\frac{1}{5}$ inch wide; mentum curved slender acuminate blunt little more than half an inch long. Petals elliptic obtuse a little broader than the sepals $\frac{1}{4}$ inch across, all rosy mauve. Lip entire obovate oblong, spatulate retuse claw narrow nearly $\frac{1}{2}$ inch long, base of lip and claw white with a patch of pink dots in the centre, limb bright mauve. Column mauve, wings near the stigma thickened undulate. Stelidia small ovate obtuse. Anther rounded skull-shaped rounded in front, mauve.

Lankawi islands, sent by Mr. Fox, and flowered in the Botanic Gardens Singapore in October, 1908.

This pretty little plant is allied to *D. Eoum* Ridl. and *D. hymenanthum* Hook. fil. From the latter it differs in its narrower petals and sepals shorter and more slender stems and in the colour of its flowers.

Bulbophyllum (§ *Sestochilus*) *Hewittii*, n. sp.

Rhizome rather slender $\frac{1}{10}$ inch through, pseudobulbs narrow cylindric 2 inches apart 2 inches long. Leaf lanceolate acute narrowed a little at the base 5-6 inches long $1\frac{1}{2}$ -2 inches wide, thinly coriaceous. Peduncles slender 5 inches long, with 1 or two sheaths below, one flowered. Bract $\frac{1}{4}$ inch long oblong cuspidate. Flower

large. Upper sepal lanceolate caudate $1\frac{1}{2}$ inches long $\frac{1}{4}$ inch wide, lower ones similar 2 inches long, rather wider than upper one, mentum about half an inch long rounded. Petals lanceolate long caudate an inch long. Lip large fleshy half an inch long. Ovate acuminate cuspidate base deeply cordate with rounded lobes. Column broad thick squared, steldia large triangular. Anther ovate hardly beaked crested with a papillose ridge.

Sarawak: Mt. Poe (J. Hewitt).

Allied to *B. galbinum*, Ridl. but one flowered and with a very different lip and more caudate petals. The color is not given but the lip has some purple in the centre and as the color of the dry flower is pale it is probably yellow.

Bulbophyllum (§ *Cirrhopetalum*) *ruficaudatum*, n. sp.

Rhizome slender with many roots, pseudobulbs very small subcylindric $\frac{1}{2}$ inch long half an inch apart. Leaf fleshy elliptic, obtuse $1\frac{1}{2}$ inches long $\frac{1}{2}$ inch wide narrowed at the base into a short thick petiole $\frac{1}{10}$ inch long. Scape very slender, filiform 5 inches long with a few scattered sheaths. Flowers 6 in a half whorl, red. Braets lanceolate acuminate $\frac{1}{10}$ inch long, red, pedicles very slender twice as long. Upper sepal ovate cuspidate caudate with a filiform point margins ciliate, lower sepals very narrow linear free nearly to the base red over half an inch long. Petals lanceolate acuminate brown ciliate nearly as long as the upper sepals. Lip yellow fleshy papillose lanceolate acute, base emarginate, and sides elevated leaving a groove at the basal part. Column short with small setaceous steldia.

Sarawak: Kuching (Hewitt).

Allied to *B. psittacoides*, Ridl., but with different pseudobulbs, and setaceous steldia.

Eria (§ *Bractescentes*) *aurantiaca*, n. sp.

Pseudobulbs cylindrical thick green 1-2 inches long an inch or more through, when dry and flattened ovoid. Leaves 2 or 3 coriaceous linear oblong deep green 2-5 inches long $\frac{1}{2}$ inch wide, obtuse. Raceme erect 3-5 inches

long, many flowered. Bracts linear oblong persistent lower ones $\frac{1}{2}$ inch long orange. Flowers about 12, orange color, pedicels slender half an inch long. Sepals narrowly lanceolate acuminate $\frac{1}{2}$ inch long, lower ones broader at the base with a short broad mentum as long as the ovary. Petals linear acuminate shorter and narrower than the upper sepal. Lip narrower shorter, side lobes rounded oblong obtuse, disc narrow with three strongly elevated undulate keels, the centre one lowest till near the base of the midlobe when it becomes thicker and taller, midlobe longer than sidelobes fleshy ovate oblong obtuse, entirely covered with sinuate keels and warty protuberances. Column short. Clinandrum with wide thin margins. Anthers large elliptic thin obtuse, divided into two thinwalled cells with a ridge in the middle.

Sarawak: Kuching (Haviland) and Moulton (1909).

A very distinct plant of the *Bractescens* series in its completely orange colour and its curious lip.

Coelogyne (§ *Chelonostele*) *phaiostele*, n. sp.

Pseudobulbs crowded, flattened curved narrowed upwards, elongate many ridged, yellow or greenish yellow, 2 inches long, $\frac{3}{4}$ inch wide at the base, $\frac{1}{4}$ inch at the top, hardly half an inch through. Leaves 2 lanceolate 8 inches long 1 inch wide gradually narrowed into the petiole apex acute, slightly coriaceous dark green, when young the edges keel, and 2 veins red, petiole yellow terete $\frac{1}{4}$ inches long. Leaves when young enclosed in 4 lanceolate flesh colored sheaths at the base. Scape from between the leaves 12 inches long subterete, raceme 2 inches or more, joints flexuous. Bracts lanceolate pinkish subacute half an inch long, flattened distichous. Flower small pedicel about $\frac{1}{2}$ inch slender. Sepals ovate lanceolate obtuse $\frac{1}{4}$ inch long white, with a pale green medium vein outside and speckled with ocreous scales. Petals narrow linear as long. Lip little longer than sepals, pandurate, side lobes linear falcate short, midlobe rotundate bilobed, base narrowed, all yellowish white,

two low ridges running from the upper angles of the lip to the centre of the midlobe. Column deep mahogany brown, foot green forming with the base of the lip a sac, the mouth partly covered with the sideflaps. Stelidia rather long linear curved, crest (margin of clinandrium) rather tall rounded crenulate, with 2 longer processes at the sides. Anther cap broad triangular flat yellow, beak short upcurved. Rostellum tooth-like. Stigma large orbicular.

A living plant in flower of this was brought me in June 1909 by Mr. Lewis who obtained it from Mt. Poe in Sarawak, Borneo. What appears to be identical was obtained by Mr. Hewitt on Santubong Mountain, and by Dr. Haviland in the same place. In Mr. Hewitt's plants the raceme has fully developed to a length of over a foot long and closely flexuous. He describes the sepals as light red brown. Column similar but deeper. Petals and lip pale yellow. I am not sure that the saccate portion at the base of the lip does not rather belong to the lip than to the column foot it is difficult to see where the column-base ends and the lip begins.

This plant would doubtless have been referred by Pfitzer to his genus *Chelonostele* but it seems almost impossible to break up the genus *Caelogyne* in the way he has done with any satisfaction. His genera run into each other with so many connecting links.

Saccolabium fimbriatum, n. sp.

Stem moderately stout over three inches long. Leaves linear lorate retuse with subacute points and a short mucro between 6 inches long, half an inch wide coriaceous-fleshy pale green. Raceme slender 5 inches long, base nude flowers few about 6 distant small. Pedicels slender $\frac{1}{4}$ inch long. Bracts very short ovate obtuse. Sepals elliptic obtuse $\frac{1\frac{1}{5}}$ inch long, apices rounded, yellow with a brown central line. Petals elliptic subacute similarly colored. Lip trilobed side lobes broad rounded oval, margins crisped yellow with a brown centre, midlobe linear narrow channelled, apex

decurved with short yellow processes pink, upper callus decurved tooth-like, spur curved cylindric as long as the lip, half portioned. Column broad stout with a broad shallow clinandrium and broad blunt stelidia. Anther ovate beaked, distinctly 2 celled. Pollinia semi-globose on a long curved club-shaped pedicel, disc very small, rounded. Rostellar lobes short rounded. Capsule oblong linear triquetrous $\frac{3}{4}$ inch long $\frac{1}{5}$ inch wide.

Sarawak at Quop (Hewitt Oct. 1908 No. 104).

Nearest to *S. rostellatum*, Ridl. in habit but very peculiar in the lip fringed with short yellow processes both on the side and midlobes. The pedicel of the pollinia is longer than usual and rib-shaped.

Saccolabium adenoncoides, n. sp.

Stem curved 4 inches long. The leaves about nine very fleshy linear acute grooved above shining dark green $1\frac{1}{2}$ inches long $\frac{1}{10}$ inch through (when dry). Sheaths transversely rugose. Flowers small solitary dull yellow green, axillary with a few ovate bracts on the short peduncle, which is $\frac{1}{10}$ inch long rather thick and angled. Sepals lanceolate narrow subacute. Petals narrower. Lip entire saccate cup-shaped with a short acute beak, and a ridge running down from it outside. Capsule elliptic $\frac{1}{4}$ inch long.

Borneo: Kuching, and Quop (Hewitt).

This has just the appearance of *Adenoucos virens*, Bl. at first, but the lip instead of being flat is saccate, much the form of *Saccolabium minimiflorum*, Hook. fil. with which the plant appears to be allied. It really seems a connecting link between the two genera *Saccolabium* and *Adenoucos*.

Sarcochilus anceps, n. sp.

Stems pendulous over a foot long flattened ancipitous. Leaves coriaceous $2\frac{1}{2}$ inches long, $\frac{3}{4}$ inch wide oblong obtuse keeled, sheaths flattened sharp edged at the back an inch long. Racemes shorter than the leaves, extruded from the base of the leaf, peduncle 1 inch long, solitary or in pairs. Flowers three or four on a slightly

thickened rachis. Bracts very small appressed ovate. Pedicels half an inch. Sepals ovate obtuse $\frac{1}{2}$ inch long $\frac{1}{5}$ inch wide, upper one narrower oblong obtuse. Petals shorter oblong ovate $\frac{1}{3}$ inch long. All reddish flesh color (salmon color). Lip shorter and smaller $\frac{1}{5}$ inch long base slightly saccate, side lobes as long as the whole lip falcate acuminate, midlobe rounded with a retuse boss at its base, base of side lobes and apex of lip scarlet, passing into yellowish red towards base of lip, with two red spots at the base inside, tip of side lobes white. Column white short with a foot nearly as long. Anther small orbicular ovate with a minute beak. Clinandrium shallow, rostellum very short. Pollinia 4 lobed, upper lobe elliptic, lower smaller, pedicel small cuneate, disc minute ovoid.

Johore: Tebrau River fl. H. B. S. Feb. 1909.

A very distinct and pretty plant very unlike any other *Sarcochilus* in the flattened stem, and salmon colored flower with bright red lip. It flowered in the Botanic Gardens, Singapore.

Dendrocolla multicolor, n. sp.

Stem short 1 inch long. Leaves about 5 terete subacute 4 inches long, $\frac{1}{10}$ inch through dark green. Scapes slender purple 2-4 inches long including raceme, which is thickened and 1 inch long. Bracts crowded short fleshy ovate blunt boat-shaped green. Pedicel slender purple nearly half an inch long. Sepals orange colour oblong spatulate narrowed at the base $\frac{1}{8}$ inch long. Petals obovate oblong, apex rounded orange with pink spots. Lip orbicular spatulate with a linear claw, and orbicular obovate limb rounded entire orange with red spots flat, calli violet large, two fleshy linear, obtuse, and two central smaller claw violet with two orange bands. Column tall orange oblong deeply channelled in front. Anther whitish deeply lobed on the top, broad very shortly beaked. Pollinia ovoid pedicel broad and short square, disc small linear. Capsule linear sausage-shaped 1 inch long, $\frac{1}{8}$ inch through.

Borneo: Sarawak, Kuching (Hewitt Oct. 08).

This species is most nearly allied to *D. fulgens*, Ridl.

Dendrocolla pulchella, n. sp.

Stem very short hardly half an inch long. Leaves 4 fleshy oblong obtuse purple about half an inch long, a quarter of an inch wide. Scape slender $1\frac{1}{2}$ inch long purple. Spike $\frac{1}{4}$ inch long terete with ovate acuminate acute recurved bracts dark purple. Flower $\frac{1}{5}$ inch across pedicel short. Sepals ovate subacute broad deep purple. Petals oblong obtuse connivent with the upper sepal deep purple. Lip bright yellow sac rather long obtuse, side-lobes broad rounded, between them at the apex a dense mass of clubbed white hairs, running up on the disc on a broad flat keel. Anther cup round retuse in front white, pollinia semi-elliptic on an ovate disc. Column rather long for the genus widening downwards. Capsule linear an inch long.

Borneo: Sarawak, Kuching (Hewitt) fl. Sept. 08.

A very small species allied to *D. trichoglottis* but with smaller deep colored flowers.

Habenaria Hewittii, n. sp.

Stem 2 feet tall leafy. Leaves oblanceolate acuminate glabrous narrowed to the base, many nerved, margin minutely undulate 12 inches long $2\frac{1}{2}$ inches wide, upper sheathing leaves lanceolate, acuminate subulate over an inch long. Raceme lax about 14 flowered. Bracts lanceolate cuspidate half an inch long, $\frac{1}{10}$ inch wide. Ovary and pedicel 1 inch long. Upper sepal galeate $\frac{1}{4}$ inch long. Lower sepals ovate falcate deflexed. Petals linear narrow. Lip trifid to near the base with three linear lobes obtuse subequal longer than the sepals, spur slender clubbed towards the apex half the length of the ovary. Column processes long.

Borneo: Sarawak (Hewitt 1908). There is no special locality given with the single specimen.

This plant seems to be most nearly allied to *H. salaccensis*, Lindl. of Java, and is the biggest *Habenaria* I have seen from Borneo.

SCITAMINEAE.

Globba (Ceratantnera) debilis, n. sp.

Stem slender, whole plant 2 feet tall. Basal sheaths spotted with violet. Leaves narrow lanceolate acuminate cuspidate glabrous, nearly $\frac{1}{2}$ inch wide about 8 in number, ligule short fringed with hairs. Panicle very slender and weak with 7 or 8 short, 1 flowered branches, $\frac{1}{4}$ inch long. Bracts very small lanceolate acuminate. Calyx tube short turbinate 3 lobed, lobes mucronate; $\frac{1}{10}$ inch long. Corolla tube twice as long, lobes ovate rounded obtuse, upper one hooded, bright orange, as long as the tube. Staminodes narrow linear oblong paler. Lip short obovate apex rounded shortly bilobed, or retuse yellow with a brown central spot. Filament $\frac{3}{4}$ inch long, anther cells elliptic, with a single subulate spur at the base as long as the ovary.

Borneo: Sambas River, Keelong (Brookes).

Near *G. panicoides* Miq. in some points and in general appearance, but the short round lip and the long slender spurs from the very base of the anther make it very distinct from any species known to me.

Gastrochilus violaceus, n. sp.

Leaves 2 or 3 together, rather fleshy smooth dull dark green above, central line pale beneath pale, nerves inconspicuous 3 to 5 inches long $1\frac{1}{2}$ inches wide, ovate obtuse, petiole 1 inch long. Spike short of many flowers, from the leaf axil, 1 inch long subsessile. Bracts lanceolate acuminate. Bracteole lanceolate acuminate with a long point $\frac{3}{4}$ inch long glabrous thin. Calyx tubular with 2 long acute teeth $\frac{3}{8}$ inch long white. Corolla tube cylindric slender creamy white $\frac{3}{8}$ inch long, lobes narrow lanceolate acute white $\frac{1}{4}$ inch long. Staminodes erect little more than half as long linear subacute broader than the petals. Lip spatulate claw with sides raised linear, limb obovate oblong emarginate little more than half an inch long and $\frac{3}{10}$ inch wide, violet with a central-primrose yellow bar, edged with minute glandular

hairs as are the staminodes. Stamen white half as long as the dorsal sepal, filament broad pubescent. Anther short oblong, crest very short truncate obscurely 3 toothed shorter than the style.

Cultivated in the Botanic Gardens, Singapore from plants supplied by T. D. Pereira, Fl. Oct. 1908. It is believed to be from Padang, Sumatra. Something of the habit of a *Kaempferia* with flowers of *Gastrochilus*. The violet coloring of the lip is unusual in that genus.

Gastrochilus hirtus, n. sp.

Stem short covered with hairy sheaths. Leaves 2 obovate oblanceolate subobtuse mucronulate, much narrowed to the base 6-7 inches long 2 inches wide, about 6 pairs of nerves conspicuous glabrous petiole and sheath 3 inches long hairy densely. Spike central, subcylindric thick 2 inches long. Bracts lanceolate cuspidate with long acuminate points thickly hairy. Floral bracts lanceolate cuspidate 1 inch long densely hairy. Calyx $\frac{1}{2}$ inch long ribbed hairy. Corolla white, tube slender cylindric over an inch long hairy, lobes lanceolate obtuse $\frac{1}{4}$ inch long hairy. Staminodes narrower acute. Lip hardly longer oblong obovate entire apex truncate, shortly toothed. Stamen crest ovate rather small, entire.

Borneo: Sarawak, Tiang Layu (J. Hewitt).

"Flowers pale white, lip with some red centrally."

Nearest perhaps to *G. Curtisii*; Bak., but the flowers are much smaller.

Gastrochilus bractescens, n. sp.

Stem woody creeping with long wiry roots. Leaves numerous lanceolate long petioled, obtuse acuminate at the base, blade 5 inches long 1 inch across, petiole 3 inches long, base 2 inches sheathing with a narrow sheath margin. Inflorescences axillary on erect peduncles 1 inch long, at first obconate 1 inch long of 4 branches each half an inch long subtended by convolute lanceate obtuse bracts. Bracts at length spreading an inch long $\frac{1}{5}$ inch wide, enclosing the spikes. Flowers numerous in the spikes small white. Bract to spike oblong obtuse

ribbed. Floral bracts small. Calyx tubular rather thick 3 lobed lobes short obtuse, split shortly on one side as long as the corolla tube $\frac{1}{5}$ inch long. Corolla tube thick, lobes linear oblong obtuse longer than the tube. Staminodes narrower linear oblong. Lip short obovate more fleshy entire. Anther linear oblong with a quadrate crest 3 toothed shortly at the tip.

Borneo: Lundu (Foxworthy 42).

Zingiber flavidus, n. sp.

Stem slender 2 feet tall. Leaves remote ovate lanceolate acuminate glabrous thin narrowed at the base a very little 4 inches long $1\frac{1}{4}$ inches wide, hardly petioled. Ligule very small truncate, sheath narrow. Inflorescences radical. Peduncle slender 6 inches tall $\frac{1}{5}$ inch through covered with elongate sheaths glabrous. Spike fusiform acuminate 3 inches long, all yellow. Bracts oblong rounded at the tip, 1 inch long half an inch wide, striate glabrous. Bracteole lanceolate linear obtuse $1\frac{1}{2}$ inches long by $\frac{1}{16}$ inch wide, hairy. Calyx spathaceous, hairy, apex rounded blunt. Corolla tube slender, 1 inch long lobes lanceolate acute, $\frac{1}{2}$ inch long. Lip lanceolate acute entire bright yellow. Anther elliptic broad fawn color, beak shorter.

Sarawak: Quop (Oct. 1907) (J. Hewitt).

Allied to *Z. gracilis* but with yellow bracts.

Alpinia (§ *Cenolophon*) *microlophon*, n. sp.

Leaves lanceolate caudate, base acuminate softly hispid on both surfaces, more densely on the midrib on both sides and the edges, 13 inches long $2\frac{3}{4}$ inches wide petiole $\frac{1}{4}$ to nearly 1 inch long, ligule lanceolate obtuse half an inch long, hairy (glabrescent in older leaves) sheath reticulate nearly glabrous. Panicle 4 inches long (or more, incomplete) densely roughly yellow hairy, branches short 2-3 flowered hairy, $\frac{1}{2}$ inch long. Bracts spathaceous hairy, with a three lobed limb, lobes short tooth-like. Calyx shorter, $\frac{1}{2}$ inch long goblet shaped, base narrowed gradually dilated upwards, very shortly 3 lobed with rounded lobes, all hairy. Corolla tube rather slender

$\frac{3}{4}$ inch long, hairy lobes oblong obtuse $\frac{1}{2}$ inch long $\frac{1}{4}$ inch wide hairy outside glabrous within. Lip $\frac{1}{2}$ an inch long, base narrow, thin widely obovate rounded, margins undulate crisped, nearly $\frac{1}{2}$ inch across. Staminodes $\frac{1}{10}$ inch long oblong truncate shortly 2 toothed. Stamen longer than the lip, filament thin flat. Anther thick and fleshy with two thick pustular ridges along the back, connective prolonged into a short thin oblong crest with three short teeth. Style a little longer, stigma cup-shaped.

Sarawak: Upper Sarawak River (Sept. 08, C. J. Brookes).

“White red streaks and blotches.” A curious species in its very hairy panicle and petals, and broad lip. The thick ridges on the back of the stamen are also unusual.

Donax parviflora, n. sp.

Stems rather short. Leaves ovate acute, often inequilateral 3-6 inches long $2\frac{1}{2}$ to 4 inches wide glabrous except for a fringe of long hairs along the midrib on the back on each side, nerves very close and conspicuous when dry. Inflorescence short, branches few 3 to 6 inches long pendulous, slender hairy, especially on the nodes. Bracts linear lanceolate acuminate ribbed $\frac{1}{2}$ -1 inch long, sparsely hairy. Flowers very small white. Ovary small silky hairy. Calyx lobes lanceolate $\frac{1}{10}$ inch long glabrous not ribbed. Corolla tube half as long, lobes lanceolate subacute 5 nerved $\frac{1}{5}$ inch long. Staminal tube short, outer staminodes narrower linear oblong. Lip oblong truncate margin crisped, keel triangular large. Stamen linear with the anther on the edge, connective not prolonged. Cucullus broad hatchet-shaped lobed. Fruit globose, hairy with few scattered hairs, seeds 2, $\frac{1}{8}$ inch long, inner face flat, outer one convex curiously warted, with five rows of 4 rounded bosses, with a depression round each.

Perak: at Ipoh (Ridley 11931); Pahang: Kwala Tembeling (Ridley 2402), Pulau Tawar (2401) and Pasir Loyang all on the Pahang river; Selangor: Woods at the base of the Batu Caves, flowering in August.

This the fifth species of this genus, is distinguished by the small size of the flowers, the extremely short corolla tube only paralleled in *D. virgata* of Ceylon and the two seeded fruit.

Schumann in *Actoplantes Ridleyi* describes the fruit of that species exactly like the fruit of *D. parviflora*, but the rest of his description applies to *Donax grandis* which has only one globose smooth seed.

In habit the plant resembles *D. grandis* but is very much smaller rarely attaining a height of six feet, and with smaller leaves, and shorter erect or suberect panicle, and the flowers are much smaller with a shorter tube.

Stachyphrynium parvum, Ridl. In describing the little *Stachyphrynium minus* in the Materials for a flora of the Malay Peninsula (monocotyledons) II. 59, I overlooked the fact that the specific name had already been used, for a Siamese species described by Schumann in the Pflanzenreich, I therefore substitute the name *Stachyphrynium parvum* for it.

I found the plant in immense abundance in Sedenah forests in Johore in August covering the ground thickly in large masses, but there were no signs of flowers or even of inflorescence.

PALMAE.

Pinanga arudinacea, n. sp.

Stems tufted, several together on a short rhizome elevated on stilt-roots four feet in height, $\frac{1}{8}$ inch thick, the internodes an inch long, rings narrow elevated. Leaves simple bilobed with widely divaricate lobes seven inches long, 2 inches wide, acuminate, or (lower leaves) three to four lobed, lobes $\frac{3}{4}$ inch across, linear acuminate; petiole 3 inches long, sheaths slightly swollen, purplish. Inflorescence from the axils of fallen leaves patent. Spathe linear oblong, boat-shaped mucronulate 2 inches long. Compound spike 3 inches long with three or four spreading branches, the middle one the longest. Rachis terete red. Flowers cream-white in distant pairs or soli-

tary spirally arranged $\frac{1}{8}$ inch long. Male flowers. Sepals short ovate, blunt. Petals ovate fleshy obtuse. Stamens 6. Anthers elliptic broad narrowed upwards white, filaments very short. A central tumour represents the abortive pistil. Female flowers. Fruit globose half an inch through scarlet crowned with a small circular stigma, pulp thick tasteless. Seed $\frac{1}{2}$ inch long, $\frac{1}{8}$ inch through fusiform, narrowed more to the base, light brown with numerous close longitudinal ribs.

The specimen from which this pretty palm was described was given to me some years ago by Bishop Hose who had had it in his garden for some years. He procured the plant at Lundu it is believed, in Sarawak, Borneo. It flowered on being planted in a shady place in September 1908, and set fruit in the following February. It is perhaps most remarkable for its globular fruit and narrow fusiform seed.

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Cryptocoryne minima, n. sp.

A very small plant with a rather stout root stock an inch long emitting copious roots, and stolons. Leaves ovate to ovate lanceolate subacute base broad rounded not cordate 1 to $1\frac{1}{2}$ inch long $\frac{3}{4}$ to 1 inch wide, dull green bullate above purple beneath, petiole 2-2 $\frac{1}{4}$ inches long, sheathing at base. Spathe sessile very small tube dilate at base, then cylindric slightly narrowed white $\frac{1}{2}$ inch long, limb ovate oblong $\frac{1}{4}$ inch long dull yellow spotted with brown. Capsule obovoid purple half an inch long.

Perak: at Tapah, in a muddy patch by the tin mine, covering the mud with its prostrate leaves.

This very small species is remarkable for the minute, curiously spotted spathes which is very difficult to see. It was only by hunting over the patch plant by plant that it was possible to find them. The fruit is really larger than the spathe and borne on a slightly longer pedicel, that of the spathe being so short that it is almost sessile, I know no species as small as this little plant.